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SOUTHERN Flight

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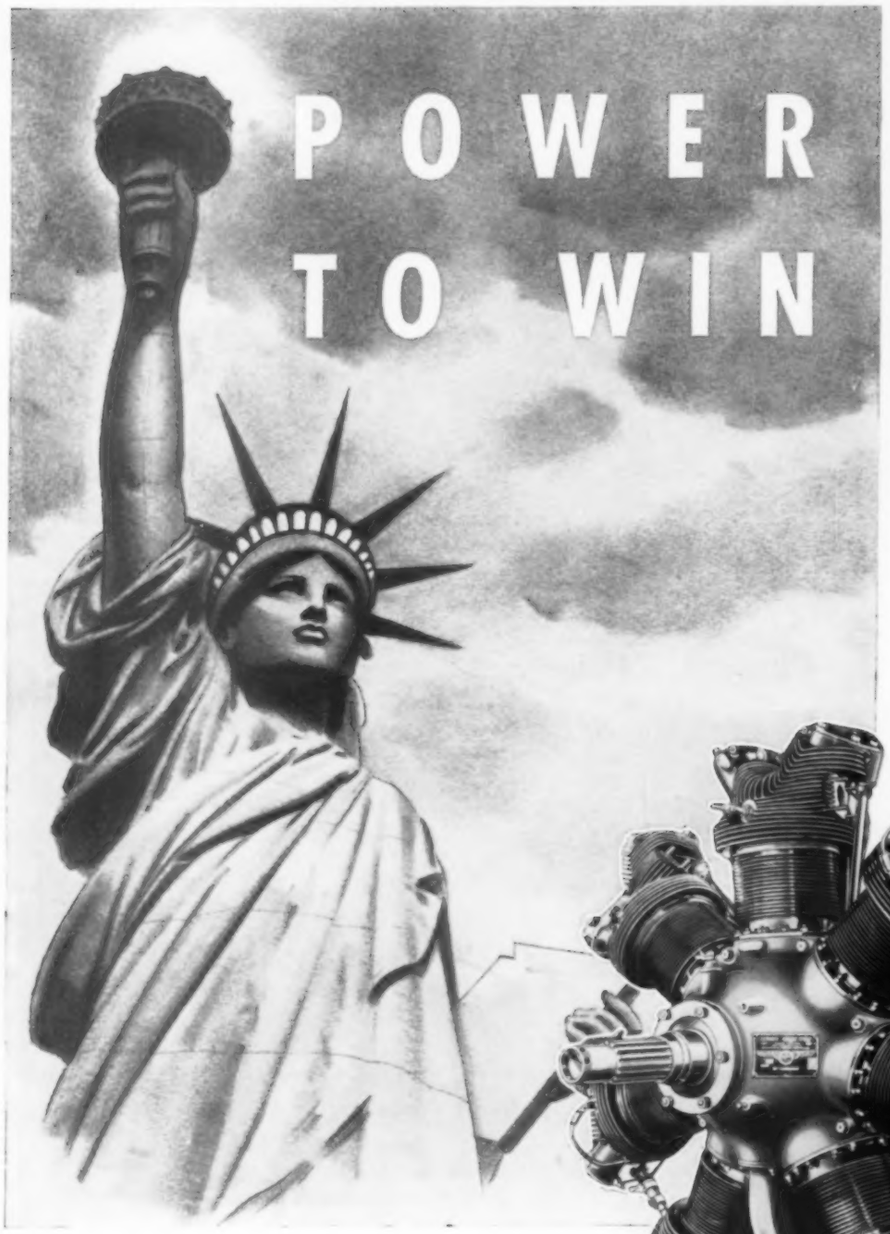

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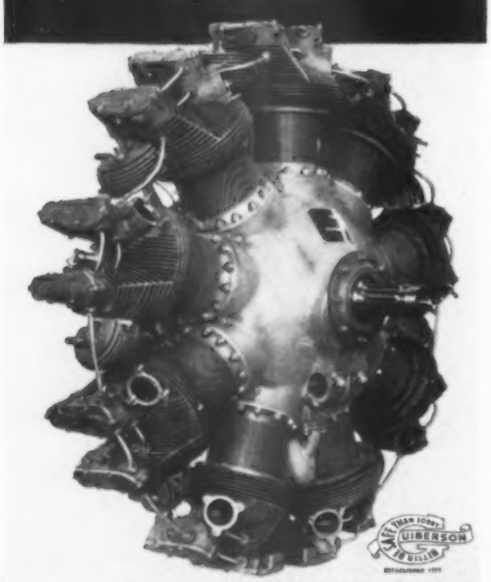

Southern Flight

The only complete monthly digest of aeronautics in the South and Southwest

MARCH, 1943 VOL. XIX, NO. 3

CONTENTS

SPECIAL FEATURES

THE PROMISE OF AIR POWER—by Tom Ashley 16

BACKGROUND FOR AIR CARGO—by Ralph E. Oursler 22

THE HELICOPTER GOES TO WAR 25

THE CAA EXPLAINS ITSELF—by R. McLean Stewart 34

CANADA HELPS DELIVER TEXANS—by Esther H. Forbes . . 38

SALVAGING PAINT OVERSPRAY—by S. Donald Perlman . . . 40

REGULAR FEATURES

REVVING UP 8

JUST AMONG OURSELVES—Editorial Comment 14

THE SKY'S THE LIMIT—by Bill Green 44

YOUR INDUSTRY—News of the Month in Review 46

NEW PRODUCTS 51

HEADLINERS 52

PORTS OF CALL—Correspondence from the Airports and Airways . 53

FLYING WITH THE CIVIL AIR PATROL 54

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Smooth take-off
IN AMERICA,
Safe Landing
IN AFRICA!
AEROLS* serve on
trans-hemisphere air route
Transport planes of Pan American Airways' famed Africa-Orient division are equipped with Aerols, including dual-tired main legs. Thanks to Aerols, those huge cargo carriers take off with effortless ease from Florida runways. Laden with vital war materiel, they soar safely above sub-infested ocean, tropical jungle and desert sands. Finally at a remote African base, these planes make soft, cushioned landings on Aerols. Plane, crew and cargo are completely protected.
Thus Aerols contribute to the successful operation of Pan American Airways' strategic supply route. And on every other front in today's global warfare, Aerols aid in the superb "ground performance" of American aircraft.
THE
CLEVELAND PNEUMATIC TOOL CO.
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Also manufacturers of Cleco pneumatic tools for the aircraft and general industry, Cleco sheetholders, Cle-Air shock absorbers for trucks and buses, Cleveland rock drills for mining and construction work.
AEROLS*
*THE SHOCK ABSORBING UNITS ON AN AIRPLANE'S LANDING GEAR; THE NAME IS DERIVED FROM THE WORDS "AIR" AND "OIL"—THE FLUIDS USED TO DISSIPATE THE LANDING SHOCKS

"I SEE THE BROWNS HAVE A NEW PLANE . . ."

It's not far away . . . the day when Mr. and Mrs. Average Citizen will notice the neighbor's new plane as they used to notice their car. For light planes have already been designed which will rival the automobile for everyday, practical use.

And already, Franklin engines have been chosen to power several of these new, experimental planes, including the amazing Sikorsky helicopter. When the war is won, all the skill and experience gained in Franklin's 42 years of air-cooled power production will go into making new and ever finer engines worthy of the planes to come.

AIRCOOLED MOTORS CORP., SYRACUSE, N. Y.

Franklin

FINE AIRCRAFT ENGINES

Currently, Aircooled Motors Corporation's entire facilities are devoted to the design and production of Franklin warplane engines for military and naval use.

The Birdmen's Perch

It would take 400 of the finest electrolytic graphite particles in Gulf Penetrating Oil to encircle a strand of the finest-drawn tungsten wire... and such wire is almost too fine to see!

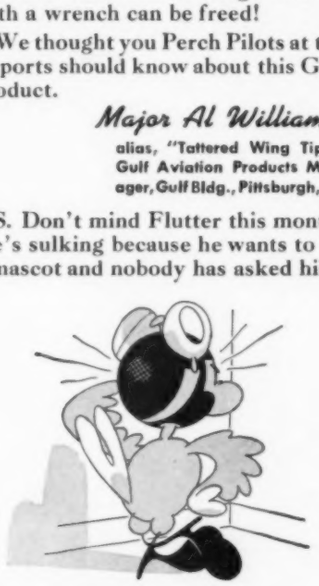
Graphite is the best dry lubricant known to science and has an affinity for steel. So we put it in Gulf Penetrating Oil and it lubricates so efficiently that rusted nuts, bolts, pipe couplings, and other threaded connections that won't budge readily with a wrench can be freed!

We thought you Perch Pilots at the airports should know about this Gulf product.

Major Al Williams,

alias, "Tattered Wing Tips," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

P.S. Don't mind Flutter this month. He's sulking because he wants to be a mascot and nobody has asked him.



ZOOT SHOOT WITH A REICH STRIKE

A bomber doing 300 mph dropped a bomb on Berlin from 10,000 feet. A helicopter which was hovering motionless, dropped the same size bomb from the same altitude at the same time. John Schomburg, of Pearl River, N.Y., wants you to figure which bomb hit first, and why. He sent us the answer, too, and that's more than we can say for a lot of you Perch Pilots.

We'll send it to you if you ask.

EVER SEEN 0.00078 OF AN INCH?

Don't laugh . . . dust particles that big have chewed up more plane engines than you could shake a joystick at. Down in Africa, this dust has been found as high as 15,000 feet. It's so abrasive that planes have been abandoned over enemy territory before they'd completed a single flight, because the piston rings were worn so badly!

Captured enemy planes were found to have filters that did about half a job. Our

Allies developed filters that were better. But American engineers devised filters capable of removing 90% of the dust from the air . . . and the problem was no longer a problem.

Unstable hydrocarbons in a lubricating oil are much smaller than 0.00078 of an inch. And old-fashioned methods of refining do about half a job of removing these impurities. But Gulf's engineers devised a super-refining technique for Gulfpride, called the Alchlor Process. *The Alchlor Process is the most effective method yet developed for removing impurities and unstable hydrocarbons from oil.*

When you use Gulfpride, the lubrication problem is no longer a problem.

KEEP 'EM LYING

Sir:

Believe me, I need some Gulf Aviation Gasoline! Our peaceful little town has been taken over by an outlaw with a super-phee-nominal secret weapon. This coyote got himself cornered while robbing the bank and found himself with a jammed shooting iron. He grabbed a bottle of G.A.G. that the bookkeeper uses to clean his typewriter, and put a little in the "catridge-cylinder" of his hog-leg. Every time he pulls the trigger, the thing spouts flame, a little cyclone screams outta the barrel and wrecks everything in shooting distance.

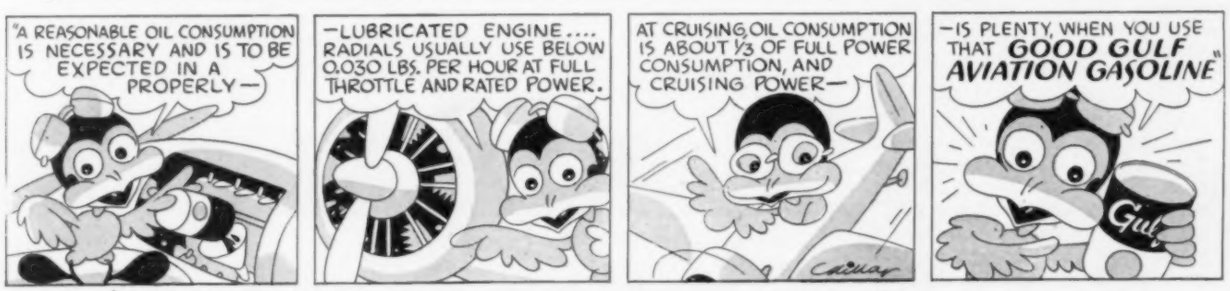
He's sitting in the saloon now, with the only bottle of G.A.G. left in the county in one hand, his cannon in the other. We gotta have some G.A.G. quick to get this critter, then we're going over and finish that Hitler varmint!

Respectfully, Ray Stoddard, Iowa State College.

Gulf Oil Corporation and Gulf Refining Company... makers of

GULF AVIATION PRODUCTS

OIL IS AMMUNITION—USE IT WISELY!


"A REASONABLE OIL CONSUMPTION IS NECESSARY AND IS TO BE EXPECTED IN A PROPERLY—
—LUBRICATED ENGINE.... RADIALS USUALLY USE BELOW 0.030 LBS. PER HOUR AT FULL THROTTLE AND RATED POWER.
AT CRUISING, OIL CONSUMPTION IS ABOUT ⅓ OF FULL POWER CONSUMPTION, AND CRUISING POWER—
—IS PLENTY, WHEN YOU USE THAT GOOD GULF AVIATION GASOLINE"
Gulf

REVVING UP

MINUTE MEN OF THE AIR: One night last December, Civil Aviation Director A. B. Corbitt of Australia broadcast a general summons to all civil airmen, ordering them to report the following night at a certain airport. The call brought all kinds of craft and pilots. At the appointed hour they were mobilized, and without delay a fleet of unarmed airplanes flew to Port Moresby, where another concentration of planes had been effected. What followed remained a secret until last month, when Director Corbitt announced the civilian air armada had rushed men, guns, food and "enormous quantities of munitions" into the battle zone under the very noses of the Japanese in New Guinea.

★

DOOLITTLE HUMOR: Several years ago, when he was Shell Oil's aviation manager, Jimmy Doolittle and two friends shared the same room in a Memphis hotel where they addressed a convention of road material dealers. Tales of the "good ole days" in aviation were just warming up when Jimmy suddenly grabbed up the telephone and demanded to be connected with the manager. Roommates John H. Jouett, aviation manager for Standard Oil, and Frank Hawks, the Texas Company's aviation manager, were puzzled when Doolittle launched a tirade against the Peabody. "This is the lousiest service I ever saw," he said in deep seriousness. "There are three of us in this room, but there is only one Bible." With that he slammed down the receiver.

★

LOOKING AHEAD: Steel will be used more and more in the construction of large airplanes, says President Harry Woodhead of Consolidated Aircraft Corporation, who also reports that Consair's huge 400-passenger model, announced recently as being on the designing boards, has now reached the mock-up stage.

★

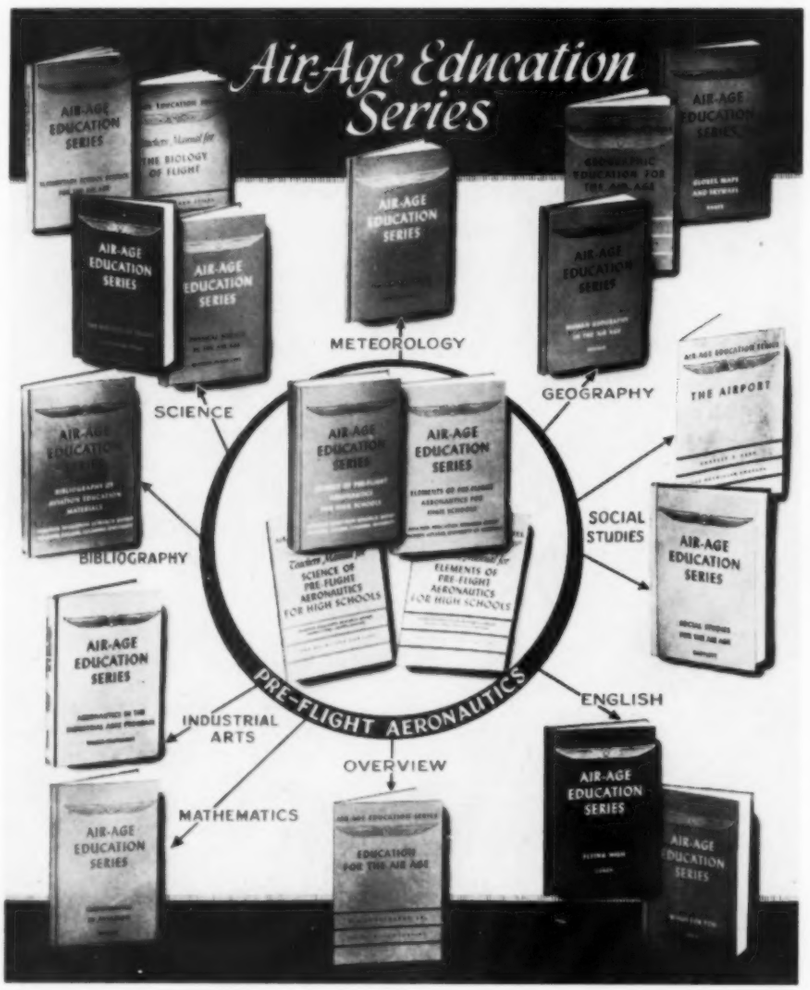
WINGS FOR A DRAFTEE: Last month Revving Up carried a little item seeking the whereabouts of Dayton Orr. One of his former students needed twenty hours verified to keep out of the walking army. The item found Orr all right, and he promptly telegraphed his address to the editor. Now the former student is happy—and the infantry is minus one clipped wing rifle carrier.

★

AVIATION FOR SCHOOLS: Shortly after Pearl Harbor, Robert H. Hinckley, then Assistant Secretary of Commerce for Air, invited some leading educators to discuss the question of making students more air-conscious. Out of this conference developed an "Aviation Education Research Project." Within several months twenty manuscripts were prepared and by September first, 200,000 books were off the Macmillan Company's presses. Nearly half a million copies are now in use in over 5,000 school systems throughout the country. Produced on a non-profit basis, with their authors accepting no royalties, the books range in price from 15 cents to 99 cents each. Designed for junior and high school students, the books touch on every phase of the curriculum —for arithmetic they provide flight problems, effects of flying on the human body involve biology, aviation literature is included for English classes, etc. The material has been produced by the Aviation Education Research Project at Teachers College, Columbia University, under the auspices of the Civil Aeronautics Administration.

★

QUOTING FIGURES: During 1942, aviation cadets and flying officers at the Army's West Point of the Air in Texas put in a total of 491,263 hours and 15 minutes. At a standard flying speed of 200 miles per hour their total distance traveled would approximate 98,252,650 miles. Or a single pilot amassing so much time would have to stay aloft fifty-six years.



HIGH SCHOOL STUDENTS of 5,000 school systems in America are now employing nearly half a million copies of these books in their daily studies. They were produced by the Aviation Education Research Project at Teachers College, Columbia University, under the auspices of the Civil Aeronautics Administration.

TODAY E.L.I. is achieving remarkable production records in the manufacture of precision-built aviation equipment on training and fighting aircraft of the United Nations . . . forecasting with the dawn of Victory, E. L. I. products of the future.

GEARED TO VICTORY

Engineering Laboratories, Inc.

CONSULTING ENGINEERS & MANUFACTURERS

TULSA, OKLAHOMA, U. S. A.

EQUIPMENT IN WORLD-WIDE USE

Throughout the past eleven years, E. L. I. as one of the largest geophysical research organizations in the World has contributed many instruments and developed services vital to the Petroleum Industry.

SCENE FROM THE WARNER BROS. MOTION PICTURE, "AIR FORCE"

There's a new glamour girl in Hollywood

She doesn't wear sweaters, or pose for glamour photographs. She's never seen at night clubs. And though her autograph is well-known in certain French and German cities, nobody has ever *asked* her for it.

Yet Mary Ann—star of Warner Brothers' new picture, "Air Force"—passed every screen test with flying colors. And that's no more than you'd expect from a Boeing Flying Fortress!*

"Air Force" is the story of a Boeing B-17, and the gallant hell-for-leather crew that flew her to glory . . . *via* Pearl Harbor, Wake Island, Manila, the Coral Sea and Australia. Made in collaboration with the Army Air Forces, it's a picture to make your heart skip a beat . . . then beat faster.

What the camera *doesn't* show is an invisible supporting cast: the Boeing designers and engineers, the technicians and researchers, the laboratory men and the craftsmen and workmen who originated the Flying Fortress and now keep a steady stream of B-17's and other war planes flowing from Boeing plants in Seattle, Wichita and Canada.

More than twenty-five different *kinds* of engineering know-how are represented by several thousand Boeing engineers. Daily they challenge the word "impossible," in a 'round-the-clock effort to do the job *better* in *less time*.

• • •

Some day this effort will be applied to making life richer and happier, in a peaceful world. For Boeing engineering skill, while devoted primarily to the continued advancement of aeronautics, also encompasses resources relevant to almost every phase of civilized life.

DESIGNERS OF THE FLYING FORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

*THE TERMS "FLYING FORTRESS" AND "STRATOLINER" ARE REGISTERED BOEING TRADE-MARKS

THE ARMY DIVES IN!

A new Curtiss warplane wears the Army colors—an attack bomber, the A-25—whose speed and destructive power will count decisively in assuring final victory. Builder of the first airplanes ever designed specifically for dive bombing tactics, Curtiss-Wright is proud that the Army Air Forces have chosen this weapon which adapts these tactics to Army offensive operations.

SECOND PRINTING: Send 10¢ for **your** copy of this fascinating 96-page history of aviation By Assen Jordanoff, author of "Your Wings", with illustrations of current fighting types. Airplane Division, Dept. M, Curtiss-Wright Corporation, Buffalo, N. Y.

CURTISS-WRIGHT
Corporation
AIRPLANE DIVISION

FIRST
Since the Birth of Aviation

1927•U. S. Army—A-3—An attack type powered by a Curtiss D-12 Engine. Designed specifically for ground strafing and low altitude bombing.

1932•U. S. Army—A-8—An early low-wing monoplane type powered by a Curtiss Conquerer engine. Increased speed and heavy bomb capacity were improved characteristics.

1934•U. S. Army—A-12—A Wright Cyclone furnished added power. Slots and flaps permitted low altitude maneuvers at slow speed. Machine guns in wheel fairings aimed downward.

1937•U. S. Army—A-18—First twin-engined airplane (two Wright Cyclones) designed as attack-bomber. Bombs were carried internally. The nose housed four machine guns or a fast firing cannon.

There goes a Headline

...the Axis won't print

Streaking from its base a squadron of Army Bell Airacobras heads for action... action that will bring forth another story of American bravery. Such a headline of heroism comes in the news from General MacArthur's Headquarters, Australia, of the award of the Silver Star to this Army Pilot for "gallantry in action:"

...not away, he made ...ming and saved his plane.

Lt. Jemison was a member of a flight of Airacobras assigned to the task of strafing Lae, New Guinea, on May 4. When bad weather made it impossible for the whole formation to reach the target, Lt. Jemison attacked individually, destroying one enemy bomber grounded at the airdrome and badly damaging two others.

Headlines read at home and "shop talk" at battle fronts tell the same story: the Army Bell Airacobra is one of the world's most deadly fighters. Starting with a new conception of aerial striking power, the Airacobra was designed from the cannon bearing nose to the tail, specifically for the job. The job it is doing is headline news... news the Axis won't print.

Victory will call for peace time planes produced by the same brilliant planning and sound engineering... but incomparably better because of the lessons learned in war. We are looking forward to that assignment. © Bell Aircraft Corporation, Buffalo, New York.

Airacobras for victory—

FUTURE PLANES FOR PEACE

BELL *Aircraft*

PACEMAKER OF AVIATION PROGRESS

"WE'VE GOT TO HAVE THEM IN 16 DAYS!"

It was BOEING on the line
...and they were insistent

The order was an emergency—a large initial delivery of AN847-16 manganese bronze double hose connections in 16 days. A new part for which blueprints had just been released.

"You're asking the impossible," we told Boeing's Purchasing Department.

"That means making patterns, tooling ...you just can't do those things in a couple of weeks."

"You have a reputation for doing the impossible," the Boeing man reminded us. "And the Army's specified these parts for all new Flying Fortresses. That means we've got to have them here in 16 days—not 17, not 18—but 16 days."

"Okeh," we said, "we'll do it."

We *did* deliver the order; and we beat the deadline. Our initial shipment was made in 12 days—4 days ahead of time.

We're glad every order is not an emergency. But for the duration we're expediting every order as though it were.

You can count on our delivery dates!

HARTWELL

AVIATION SUPPLY COMPANY
AIRCRAFT PRODUCTION PARTS

3417 CRENSHAW BLVD., LOS ANGELES
Dallas, Texas · Detroit, Mich. · Kansas City, Kan.

JUST AMONG OURSELVES

State Aviation Legislation During Wartime

This is no time to pass any kind of state aviation legislation unless it's to repeal aviation legislation already in existence. We can think of nothing so premature, absurd or ridiculous as for state legislative bodies to busy themselves with regulatory statutes concerning civil aviation at this time.

Any state aviation legislation affecting civil aviation proposed at this time probably is sponsored by one of three categories of people:

1. Those who would seek to secure for themselves the golden (?) fruit of postwar aviation development. These are the dreamy opportunists who would drag down all civil aviation, commercial and non-commercial, in the hopes of providing a political set-up favorable to their interests.

2. Those of the bureaucratic breed so prevalent during the past ten years who would regulate democracy out of existence if so permitted. Now that aviation has been "discovered" it is a ripe field for the bureaucrats to pounce upon.

3. Those who are so grossly ignorant as to believe you can erect state borders and barriers around the airplane by passing laws. In fact, through their blind ignorance they do not even realize that there is little left in civil aviation to regulate. They do not know that civil aviation is practically 100 per cent militarized and what small portion has not been, will be before long.

State aviation legislation is now in the mill in Texas. Of all the states in the Union that should steer clear of premature aviation legislation, surely Texas is that state. Its broad geographical expanse, its healthy aviation history since pioneer days that may be attributed directly to the friendly attitude of local and state political bodies during the past years, and because Texas now has become one of the truly great aviation manufacturing as well as training and operating centers in the United States, the Lone Star State has little business entertaining the idea of regulating civil aviation in any department.

There are two bills, one in the Senate and one in the House. Both bills declare that "sovereignty of space above the lands and waters of this State is vested in the State to the exclusion of any and all other governments or governmental agencies whatsoever. The use of such space for the operation of aircraft in the transportation of persons and property for hire in intrastate traffic is declared to be affected with the public interest and that such use should be effectively regulated in all its phases relating to the public interest."

These two bills propose to regulate intrastate air commerce. Think what chaos would result if every state should declare that "sovereignty of space above its lands and waters" is vested in each respective state! The idea is so ridiculous and preposterous it borders on the pathetic.

Civil aviation everlastingly has been over-regulated by the Federal Government, its natural growth thwarted and stifled. When war broke out, we had less than 400 airliners in scheduled service and we should have had at least 2,000.

The bulk of the 300-odd airliners are now in military service and the few that are left for schedules are employed entirely for war transport of passengers, mail and express. This sad situation of too few air transports can be laid at the feet of short-sighted, unsympathetic legislation and over-regulation. Now some of the states would add their two-bits worth of ignorance and bureaucratic regulation, *at a time when the boys who will be most affected are off fighting the greatest war the world has ever known.*

No, Texas! Don't get out on the same brittle limb that so many states climbed out on during years past with silly aviation legislation. Get your senators and representatives to fly around a little and study the airplane in its true perspective. Encourage them to get down to brass tacks and concern themselves with winning the war and not imposing unnecessary, unwanted laws and regulations on a phase of aviation that doesn't even exist.

Let's Honor Our Flight-Test Heroes

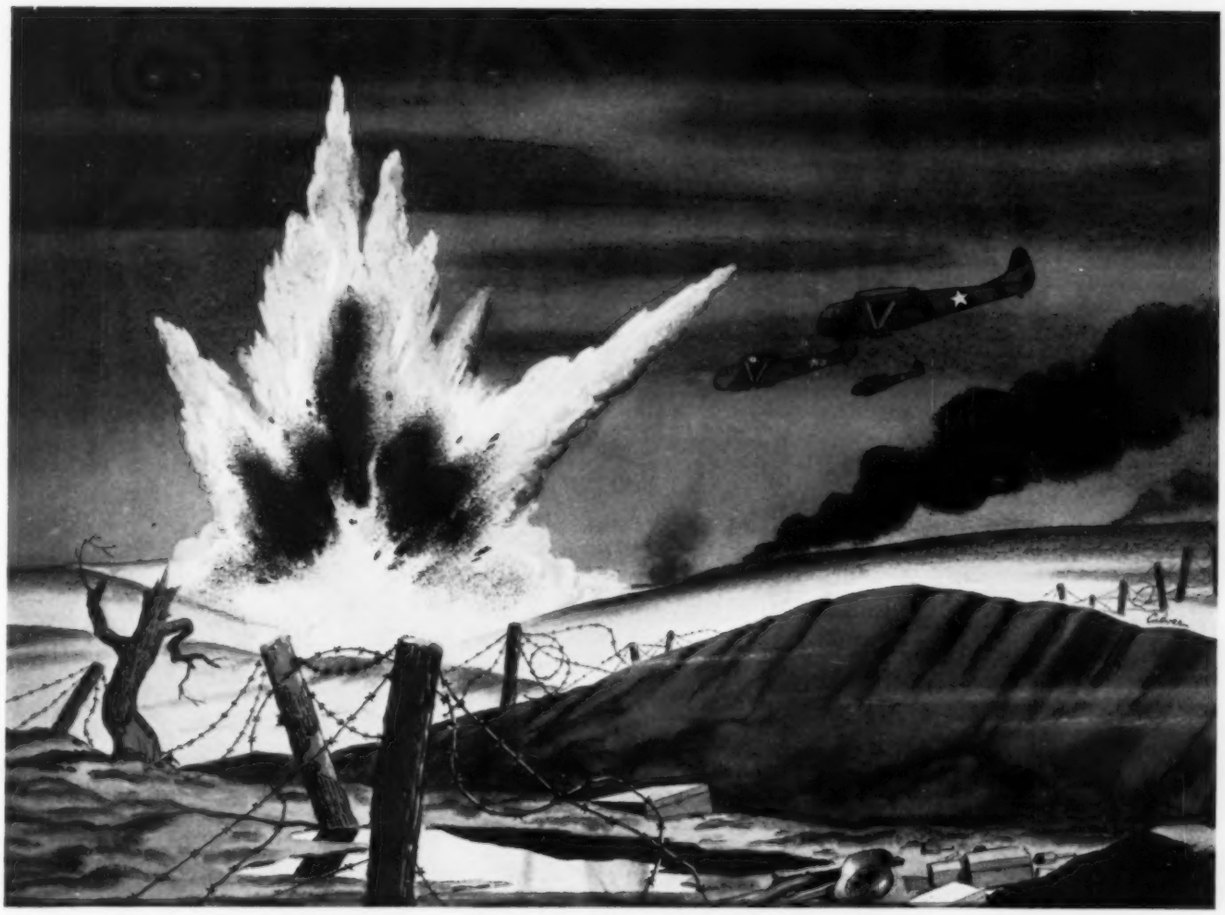
A tragic loss to aviation and airmen at home and on the fighting fronts was the deaths of Eddie Allen, director of the Boeing Aircraft Company's Flight and Aerodynamics Department, and ten other Boeing test crewmen.

These men, all outstanding in flight engineering and research work, died in line of duty while engaged in one of the most important phases of aviation. They were combating the enemy just as effectively as if their bomber carried block busters over Berlin or Tokyo, for their flight research efforts were directed at improving the flying equipment with which the enemy will ultimately be defeated.

It is well that we pause and consider the position of test pilots. Eddie Allen, symbol of modern aviation, insisted the real test pilot is a scientist, and disliked the movie conception which pictured him and his kind as daredevils. Eddie Allen's 7,000 hours of flight testing were highlighted by his time in giant aircraft; he performed initial tests on such types as the Boeing XB-15 bomber, the Sikorsky "Flying Dreadnaught," Consolidated's four-engined Navy bomber, Boeing's Clipper and Stratoliner, several models of the B-17 Flying Fortress and finally Lockheed's giant Constellation.

We think it is significant that many of these planes are proving to be the chief weapons by which we and our allies are forging victory over the Axis. The Flying Fortress has proved its superiority not only to enemy bombers but to the best interceptors Germany and Japan have been able to throw against it. Pan American Airways has proved by hundreds of thousands of transoceanic miles of passenger schedules the almost incredible safety which the Boeing Clippers have inherited from endless flight-test engineering. And the substratosphere, in which Eddie Allen and his crews have spent over 30,000 hours, is being conquered more rapidly than most observers believe.

Daredevils? No, Eddie Allen and his kind cannot be described as daredevils —no more than combat pilots who calmly and efficiently carry the fight to the enemy regardless of odds. Their accomplishments are born not of recklessness but of sheer guts and bravery, and of the determination to succeed in victory. Such test engineers as Eddie Allen should be counted among the few outstanding civilians whom the Commander-in-Chief is privileged to honor with war citations.



NO MAN'S LAND IS A MYTH

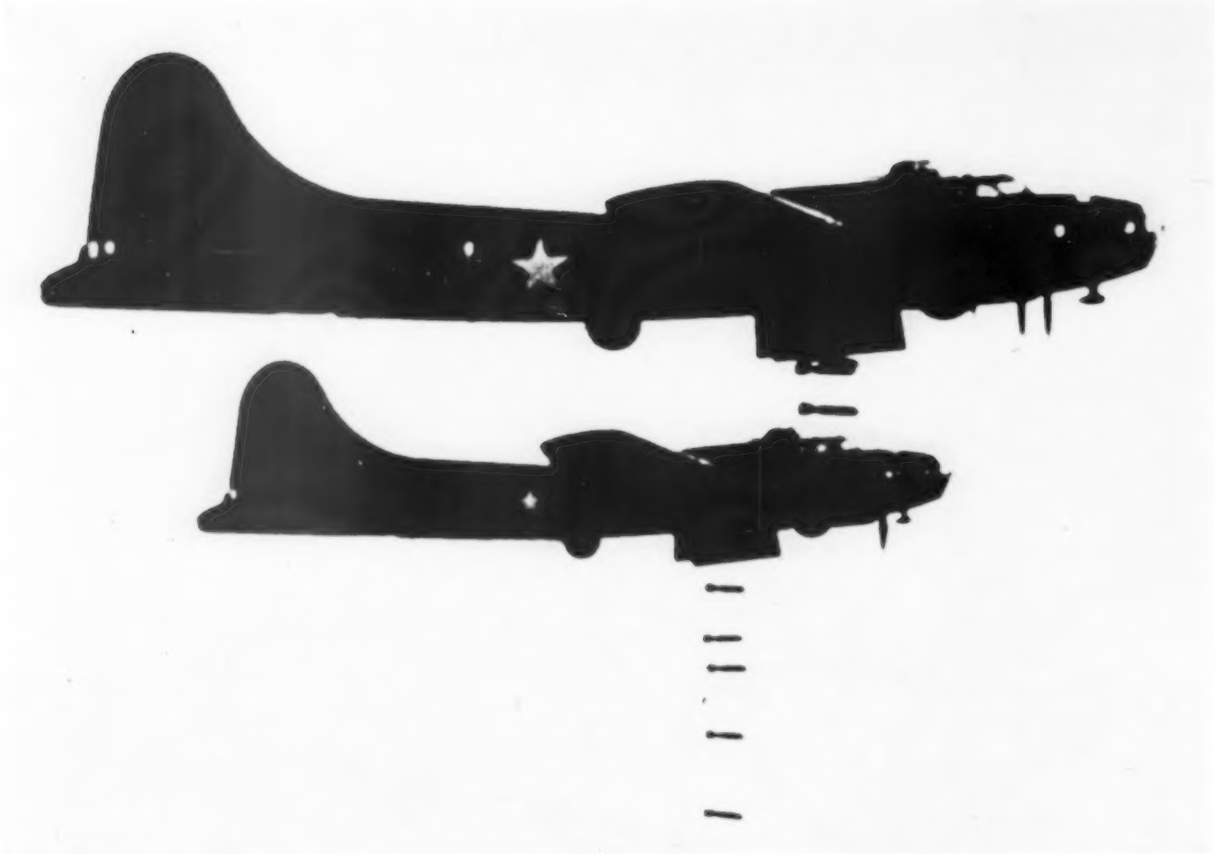
There never was a war like this one. Time-honored theories, tactics and traditions have been exploded. Even no man's land has disappeared. Twenty-five years ago it was a desolate hell-hole of mud and wire. Today it is just a myth because the gliders have moved in.

Gliders are no respecters of persons or places. Soundlessly, they duck into (and out of) fields and clearings too small for planes . . . landing heavily armed advance forces and supplies virtually under the enemy's guns.

In our rapidly growing air force, nine- and fifteen-place gliders are being groomed for an assault on all fronts. They were designed by WACO . . . are now being produced in quantity by fifteen other plane manufacturers under WACO's supervision. Thus WACO—the oldest name in commercial aviation—becomes, until victory, a prominent name in military aviation.

WACO AIRPLANES

THE WACO AIRCRAFT COMPANY • TROY, OHIO, U.S.A.



Bombers, not fighters, win air superiority. Flying Fortresses, like these, shown over an enemy target, are daily proving the soundness of American air power conceived in the creation of the GHQ Air Force in 1935.

The Promise of Air Power

PART I.

By TOM ASHLEY

SEVERAL recent developments give promise that the inactivity of the U. S. Army Air Forces over Germany is about to end. The strongest intimation of immediate, full-scale employment of American air power against Germany came with the announcement that Lieutenant General Frank M. Andrews, perhaps the world's leading air strategist, had been transferred from the Middle East to London, where he now commands all U. S. operations in the European theater. General Andrews is the symbol of aggressive air power, the champion of concentrated attack.

He is expected to extend the range of AAF attacks on Germany without delay, seeking out and systematically destroying the source of German military strength. When he does, the world will witness the most efficient employment of air power yet demonstrated. Frank Andrews eight years ago laid the foundation for an American Air Force capable of performance vastly superior to anything yet demonstrated by the *Luftwaffe* against England and Russia.

To understand air power as it will shortly unfold over Europe, we must go back a few years and trace the development of the old GHQ Air Force.

When placed in command of the GHQ Air Force in 1935, General Andrews instituted changes which have identified March 1 of that year as the birthday of modern American air power. He provided then for tactics, equipment and crews which are even now, eight years later, far ahead of enemy developments.

Air Power's Starting Point

General Andrews worked unceasingly for more planes, more pilots and crews and more bases. The GHQ Air Forces in 1935 possessed less than 400 airplanes of all tactical types, yet its commanding general spoke in terms of global air power. The four-engined Boeing B-17 was being readied for its first tests, but the most powerful bomber he had in the field was the twin-engined 10-ton Martin. The most destructive form of aviation we possessed, in available form, was attack, and our most powerful unit was the pioneering Third Attack Group —three squadrons in all—which specialized in developing new tactics to dive bomb and strafe enemy troops and ships.

As for pilots and crews, there were barely enough to man the pitifully few airplanes. The GHQ Air Force was comprised of three wings, each having a nominal strength of 100 or so airplanes in round numbers. Regular Army pilots were rare, for the policy was to limit their select ranks to veterans and Randolph Field graduates who had also graduated from West Point. Other new pilots turned

Now that Lt. Gen. Frank M. Andrews is in command of the European Theater, Germany is expected to receive the full force of American Air Power. His plans were formulated beginning in 1935 when the GHQ Air Force was created. They are reviewed here in the first of a series of articles.

out by the training center were generously allowed a brief tour of active duty with tactical squadrons and then dumped abruptly into civilian ranks.

The GHQ Air Force was placed on a one-year service test. The officers in charge were naturally champions of their own creation. None had greater pride than Andrews, and he "sold" his prized possession to the Congress and the public to the best of his ability. After seven months he had this to say:

"As the instrument of our air power, the Air Force is here to stay. It is not an experiment except that the details of its organization, and they are many, are not stabilized or fixed. It is quite certain that all details will not be worked out during the service test period, but much experience will be gained during that time. As a matter of fact, it is to be hoped that all details concerning the Air Force will never be considered as fixed. Fixation means inability to accept and adopt new ideas, and prevents progress."

The First Goals

The Baker Board had recommended creation of an Army Air Force of 2,320 airplanes, at home and in the Islands and the Canal Zone, by 1940 —a five-year plan for air strength. But to convert that *projected* strength into *air power*, the War Department possessed no cut and dried formula. Its air officers would have to develop the "know how" when it came to operating large numbers of airplanes. General Andrews and his staff, bold theorists but actually far more practical and realistic than some authorities believed at the time, decided promptly that air strength would have first to be mobile—capable of concentrating within hours at any point in the United States. This the Air Corps had never been able to do, for at the last West Coast maneuvers some units took days instead of hours to move from the East Coast to California. Rain made intermediate bases soggy and pursuits nosed over in elements of three's while B-6 crews bedded down for the season when their bombers became mired (one crew stayed in the mud so long two of its enlisted members met and married local girls near a Louisiana landing).

But bases without hard runways were not the only essential for mobility. The Andrews formula called for a separation of housekeeping duties from tactical training at Air Force bases in order that the GHQ Air Force's three wings could become "floaters" in a literal manner. Thereupon something new was added—organizations named "station complements", the keepers of the air bases. From that day on Air Force units began the intensive practice of venturing across country, not once a year but as frequently as gasoline allotments would allow. No longer chained to localities by non-tactical chores such as grass cutting, supply scheduling and similar menial tasks, squadrons, groups and wings began practicing long-range combat missions.

Mobility was soon achieved by General Andrews and his staff. Then, by experience, it developed that cross-country operations required long-range weather forecasting and instantaneous communications to equip scattered bases with minutes-old weather reports. A handful of officers became experts in the most advanced meteorology ever undertaken. The GHQ Air Force, plotting the course of nation-wide air power, was eventually to need hemispheric and even global weather forecasting if it achieved General Andrews' goal of defending the nation by bombing the enemy "at great range and with great force."

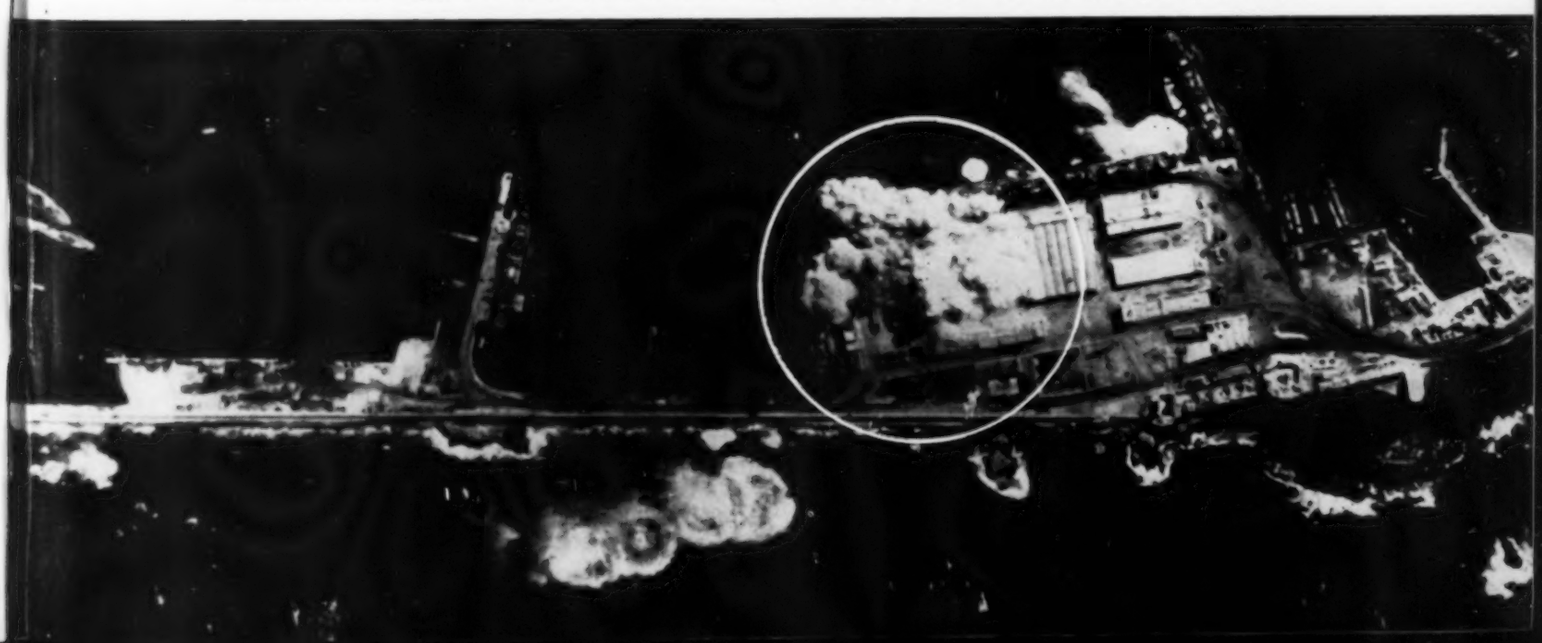
Blind flying, so long avoided, was now a "must" and at last received all-out development, as did aerial navigation.

Charting Air Force Missions

With far-ranging operations taking definite shape in plans, if not in reality, General Andrews conceived the necessity of training his flying personnel not as individuals, as had been customary, but as teams. Bombers, he explained, would operate away from their bases over periods of many hours, and to maintain effective combat ability their crews must develop the art of working closely together as units.

(Continued on page 20)

High altitude bombing scored accurately at Tripoli, where the Spanish Mole (circle) was struck again and again. Industrial areas of Germany will be subjected to the same kind of accurate day bombing by AAF units. (OWI Photos by Army Air Forces.)



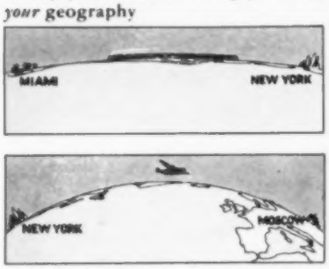
This advertisement is one of a series which will appear in national magazines and newspapers this year as Consolidated's contribution toward a clearer public understanding of "aviation geography."

CONSOLIDATED

YOUR CHILD CAN SHOW YOU A NEW WORLD

MANY a time, when the going got tough, you've probably given your child a helping hand with his homework in geography

But now the picture is reversed. Today your child can help *you* with *your* geography



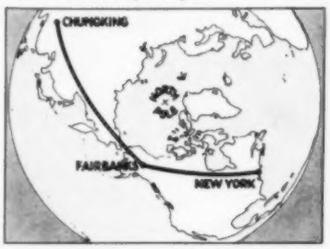
Today it takes *less time to travel from New York to Moscow by plane than from New York to Miami by train.*

His modern geography book is unfolding to him a world that didn't exist when you went to school. A world, for example, in which planes are spanning the Atlantic in a matter of 400 minutes—and a man can travel from New York to Moscow by plane in less time than he can go from New York to Miami by train—and the route from New York to Bombay is not a 3-week voyage past Gibraltar and Suez, but a 40-hour flight where the way stations are Iceland, Oslo, and Moscow.

In this new world, the "rowboat" geography you studied as a child has been supplemented by today's "aviation" geography The earth, and all the people on it, have become a global community And rather a small one, at that.

Barriers have been leveled off. Oceans are small bodies of water

From New York *to Chungking, China, by train and ship, is about 11,300 miles—at least a month-long voyage.*



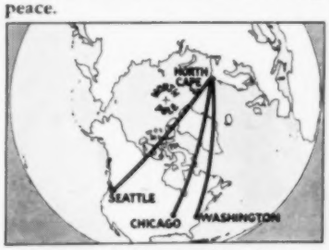
By swift *long-range plane — via Fairbanks, Alaska—Chungking lies only 7500 miles, or 38 hours, from New York.*

separating nations which must now become either friendly neighbors or close enemies. No spot on the globe is more than 60 hours distant from your local airport!

This is the world your child is being taught at school. And it is *our* world, as it really is.

We must quickly learn to understand it. For only then can we look beyond the horizons of the present toward the future and its promise.

One thing is already as clear as though written in mile-high letters in the sky. Our growing air power is today becoming a mighty weapon in our hands for Victory Tomorrow it will be one of the implements with which freedom-loving nations can help build and enforce an enduring peace.



A German bomber *squadron based in Norway could, by flying approximately the same distance, bomb Washington, D. C., Chicago, or Seattle.*

It is this vision which today inspires the tens of thousands of American men and women whose life and job it is to build the finest aircraft in the world, faster than they have ever been built before.

• • •

Consolidated Aircraft Corporation

San Diego, California • Fort Worth, Texas
Tucson, Arizona, New Orleans, Louisiana

Member, Aircraft War Production Council

★ ★ ★ ★ ★ ★

QUICK FACTS FOR AIR-MINDED READERS

There are two American four-engine bombers flying on today's world battle fronts. One is the Flying Fortress (B-17), designed by Boeing. The other is the Liberator (B-24), designed by Consolidated.

• • •

Consolidated has been a big-plane builder for more than 15 years. The company is 20 years old. Today, in addition to the Liberator (B-24), Consolidated also builds the Catalina (PBY) Navy patrol bomber, the Coronado (PB2Y) Navy patrol bomber, and the Liberator Express (C-87), transport version of the Liberator bomber

• • •

Of the many tens of thousands of aircraft workers at the Consolidated plants in Fort Worth and San Diego, almost 40% are women.

• • •

Consolidated was the first to build long-range bombers and huge transport planes by mass-production methods, on a moving assembly line.

• • •

Liberator bombers and transport planes have broken all records for both trans-Atlantic and trans-Pacific flight. One Liberator flew to London in 400 minutes. Another flew from Australia to the U. S. in 35 hours and 53 minutes.

• • •

The globe-girdling Consolidated Liberator, dubbed "Gulliver," which carried Wendell Willkie on his 31,000-mile round-the-world flight, was the first plane in history to span Siberia and cut across the Gobi Desert and Mongolia, the first to fly from China to the U.S. via Alaska.

The Consolidated Aircraft plants at Fort Worth and San Diego cover so much space that company messengers are equipped with bicycles and motor scooters.

• • •

Through the use of wood plastics, Consolidated is now saving 200 pounds of precious aluminum in the construction of each Liberator bomber.

• • •

How fast will the planes of tomorrow fly? A new wind tunnel is now nearing completion on the West Coast which will enable aircraft manufacturers to test planes flying at speeds approaching that of sound itself — 741 m.p.h.!

• • •

On Consolidated's assembly lines there will soon be gigantic planes which will literally dwarf even the huge Liberator.

AIRCRAFT ***DESIGNERS AND BUILDERS OF THE LIBERATOR, CORONADO, CATALINA, LIBERATOR EXPRESS***

Planned during Peace ...Proved by War

• Six years ago—when the world was at peace—American Export Lines and American Export Airlines launched new programs of expansion—for greater world commerce and stronger national defense.

• To attain this objective, American Export Lines designed and built large, modern, fast freighters. The then newly established American Export Airlines announced the first non-stop transatlantic air service, began developing its organization, and ordered large, long-range transport planes.

• Today—transportation holds the key to victory in this global war. Fighting men and materials are speeding to distant fronts—lengthening supply lines are being kept open. Transportation—planned during peace—has gone to war.

American Export Lines, which for twenty years, prior to this global war, had regularly served North Africa, Mediterranean and European ports, now is operating its great fleet of fast cargo ships—entirely in the war effort—wherever duty calls.

American Export Airlines, with its fleet of long-range giant aircraft, is maintaining regular service over the North and South Atlantic—entirely in the war effort—wherever duty calls.

American Export Lines Airlines

25 BROADWAY, NEW YORK

PROMISE OF AIR POWER

(Continued from page 17)

The senior officer in a bomber crew could thus organize his men more efficiently, laying the foundation for larger teams comprising squadrons and groups.

Specialization, exemplified by bomber teams, was applied by General Andrews to every phase of combat training. The kind of an organization he planned depended on highly-developed skills, airplanes designed for specific missions, and coldly-calculated strategy. Economy of force had much to do with this policy, but the determining influence was General Andrews' deep-rooted conviction that air power, properly employed at the proper moment, would decide victory or defeat in the field. There could be no half-measures with air power, if it were to succeed. He would select his targets carefully, and destroy them as efficiently as possible—with specialized air power.

America's geographical location implied that this nation, if attacked, would have to fight off invasion by sea and by air. The initial targets would be enemy bombers, ships and perhaps hostile troops along the beaches. Linked with these would be outlying sea forces, aircraft carriers and captured islands used as air bases. Beyond them would be the enemy's homeland, the source of his sea and air fleets.

Under the plan of the GHQ Air Force effected by General Andrews and his staff, *pursuit aviation* would be assigned the mission of intercepting the first enemy bombers to attack us. Invading troops and their landing boats would be the target assigned to *attack aviation*, while *bombardment aviation* would confine itself to enemy warships, aircraft carriers and island air bases. Long-range bombardment aviation, of which the B-17 was the prototype, would simultaneously seek out distant sea and air forces and the enemy's homeland.

In event of a campaign on land, the GHQ Air Force would operate both *with* the field forces and *beyond* them, with pursuit and attack providing the bulk of air support for ground units while bombardment directed its range and large-size bombs against behind-the-lines supplies and communications. Pursuit's mission of destroying enemy aircraft in the air left to attack aviation the destruction of enemy personnel and equipment on and near the battlefield. Attack had been developed since 1921 as a highly specialized ground-strafing tactic. Its optimum "altitude" was the tree tops,

(Continued on page 33)

Continuation of a series which started in the September, 1942 issue.

7. Swinging Propellers

a. Swinging propellers to start engines is dangerous to life and limb unless properly done. Servicemen should understand the theory involved and should practice swinging propellers with the switch off until proficient. This practice should take place only under proper supervision.

b. To start an engine by hand, the serviceman will turn the propeller several times with the switch off in order to charge several cylinders with gasoline. Then, with switch on, the serviceman pulls the propeller quickly through one or two compression strokes at which point the engine should start.

c. Before touching the propeller, the serviceman should call "switch off," wait for the pilot to reply "switch off" and then swing the propeller. When ready to start the engine, the serviceman should step back, call "contact," (not "switch on," which is too similar to "switch off"), wait for the pilot to reply "contact" and then start the engine. Never call for "contact" or "switch off" while touching the propeller.

d. To swing the propeller, stand in an erect position a little less than an arm's length away, place fingers loosely on the blade and swing it. On some planes, it will help if, at the same time as the arms are swung, the right foot is swung from in front of the left foot to the right and backward.

e. Some precautions to take before swinging the propeller:

(1) Make sure there is a competent person in the cockpit since an incompetent one is a serious hazard. For instance, he may turn the switch on instead of leaving it off.

(2) Be certain orders for "contact" and "switch off" are complied with. Verbal repetition of the order is customary. If not certain, find out. Don't guess.

(3) Watch out for slippery footing such as mud or ice.

(4) Remove or fasten securely loose clothing such as coats or neckties.

(5) Never lean forward. Body weight should be placed so that the tendency is to fall backward, or sideward, not forward.

(6) If temporarily fatigued because of repeated swinging of the propeller, stop and rest. Tired persons are likely to be careless.

(7) Hold the propeller loosely with fingers. Full lengths of the fingers should never be hooked over the blade.

(8) Always handle the propeller as though the switch were on, even if supposed to be off. Once in awhile, the switch will be on by mistake or perhaps because of a broken ground wire.

8. Assisting Mechanics

In order efficiently to assist certified mechanics in maintenance of aircraft and engines, servicemen should know:

a. Use of common tools. For example: How much a nut should be tightened; how to use drills; choice of the proper tool for the job, i. e., small screw drivers for small screws, never using pliers to turn or hold a nut, etc.; the function of the various kinds of wrenches.

b. Use of supplies such as safety wire, cotter pins, special fasteners, special screws, dope, etc.

c. Use of equipment such as air compressors, sprayers, battery chargers, etc.

d. The names and functions of various component parts of aircraft such as aileron, longeron, fuel line, switches, valves, etc.

TRAINING DIRECTIVE NO. 27
AIRPLANE INSPECTION

1. General

This course of instruction is for the purpose of informing airplane and engine mechanics, mechanics' helpers, and other maintenance personnel of the Civil Air Patrol relative to the inspection of airplanes, airplane engines, and auxiliary equipment as practiced by the Army Air Forces.

2. Text

War Department Technical Manual—Airplane Inspection Guide (TM 1-415) will be used as the text for instruction in this subject.

3. Distribution

Copies of this Directive and the Text will be distributed on the basis of four copies per Headquarters.

4. Requirement

All Civil Air Patrol members assigned to the maintenance of airplanes, airplane engines and auxiliary equipment are required to take this course.

5. Instruction Procedure

In addition to required individual study of the text, there will be at least six classroom instruction periods of one hour each which will include lectures, practical demonstrations, general discussion, and questions covering this subject.

TRAINING DIRECTIVE NO. 28
DUTIES OF SERVICEMEN

1. General

The purpose of this course of instruction is to give servicemen an outline of their duties and some practical suggestions regarding their work.

2. Text

The text to be used in this course is presented in the following pages.

3. Distribution

This directive will be distributed on the basis of four copies per Headquarters.

4. Requirement

All personnel assigned to servicing of aircraft are required to take this course, unless already qualified for such work by previous training and experience.

5. Instruction Procedure

In addition to required individual study of the text, there will be at least five instruction periods of one hour each, devoted to discussion, explanation, and practical demonstration. Emphasis will be placed on practical demonstrations.

Duties of Servicemen
Section I.
GENERAL

1. Nature of Work

Servicemen, in general, perform such duties as servicing aircraft, assisting in aircraft maintenance, operating and maintaining airport facilities. The proper execution of these duties is an important factor in the safety and efficiency of aircraft operations.

2. Supplementary Instruction

It is suggested that servicemen study texts on theory of flight, maintenance, operation and construction of aircraft, instruments and power plants, etc. Such study will make them of greater value to their organization.

Section II.
SERVICING AIRCRAFT

3. General

Under the heading of servicing aircraft come such operations as refuelling, cleaning, and handling of aircraft, swinging propellers and assisting mechanics. Familiarity with aircraft obtained in this work is a valuable background for future advancement in aviation.

4. Refuelling

Refilling of aircraft gasoline and oil tanks requires certain precautions. They are:

a. When preparing to refuel a plane, be careful to walk, stand and sit in the right place. For instance: Do not stand on wheel pants. Do not sit on the leading edge of the wing. Do not walk all over the wings. (Use walk-ways). Do not lean on the windshield. Airplanes are designed to take such concentrated loads in only a few places. Find out where those place are.

b. Fill gasoline and oil tanks only to their rated capacity, usually shown on the tank cap, and not completely full. Room must be allowed for expansion. Otherwise, gasoline may overflow and create a fire hazard. Oil may expand and create enough pressure to force off the tank cap.

c. Use the proper grade of fuel. Gasolines are graded by octane number, oils by SAE number. If engines are not supplied with the correct grade of fuel, serious damage is likely to result. Note that oils occasionally are graded by code numbers assigned by the oil company. Frequently such numbers are exactly twice as great as SAE numbers. Find out the proper octane numbers and SAE numbers for engines commonly serviced at the airport.

d. Before starting to fill a gasoline tank, one end of a ground wire should be connected to a part of the plane in metallic contact with its tank. Exhaust pipes are frequently used. The other end of the wire should be permanently attached to the storage tank. By so doing, any static electricity which may have collected on the plane or elsewhere will be discharged harmlessly. Otherwise, when the hose nozzle is put in the tank, the static may discharge in the form of a spark, causing fire.

e. Always make sure tank caps are replaced securely. In the case of gasoline tank caps, also make sure the vent-hole is not clogged and that any tubular vents face in the proper direction. Otherwise, the gasoline may not feed properly.

f. When there is a question as to amount of gasoline in a tank, ALWAYS find out by measuring with a clean stick. DO NOT trust gauges. They are too likely to be wrong.

5. Handling

Handling of aircraft includes moving by hand or by tractor and staking out. Precautions required are:

a. When pushing (or pulling) airplanes, always push on a strong place. Examples are: roots of the struts; fittings where brace wires are attached; the propeller hub; points where two or more struts come together; landing gear tubular members. Do not push on such places as the middle of struts or wires, any trailing edge, propeller blades at any distance from the hub, or unsupported fabric. Do not yank planes around by the rudder or rudder post or wires. Airplanes are not designed to withstand such concentrated loads except at a few places.

b. When moving airplanes close to other airplanes or hangar doors, verify clearance by looking, not guessing.

c. The tail of an airplane should be lifted by the lift handles or at a point on the lower longerons directly below a brace tube or compression member.

d. When towing an airplane by tractor, start and stop smoothly and slowly, not with a jerk. When towing close to another plane, hangar, gasoline pump or other obstruction, either keep a ten-foot clearance or have a person stationed at the obstruction to prevent possible collisions.

e. When airplanes are to be left unattended in the open for a length of time, they should be staked down with control surfaces immobilized and with such covers as are needed.

(1) The general procedure used to stake down an airplane is:

(a) Set brakes and check the wheels.

(b) Drive a stake into the ground in front and outside of each wing and behind the tail.

(c) Attach a rope from each stake to a strong point on the plane such as junction of wing and strut; tail wheel assembly. On some airplanes special fittings are provided to which the ropes should be fastened. Ropes should not be tied too tight as moisture may cause them to shrink.

(2) To immobilize the control surfaces either use a wooden clamp to hold them in neutral or lash the control stick or wheel and rudder so that they cannot be moved. If a clamp is used, attach rope from the clamp to the door to remind the pilot to remove the clamps before takeoff.

(3) Engine covers serve to keep rain from wetting the magnetos. Windshield covers prevent sunlight from discoloring pyralin.

6. Cleaning

Cleaning of aircraft is necessary for preserving the surface, improving the appearance and as an aid to maintenance. Breaks in ribs, deformations in metal structures, tears in fabric, excess play in fittings or controls are easily found when cleaning the airplane. The following suggestions cover general cleaning work:

a. On fabric surfaces use non-alkaline, non-abrasive cleaners. Do not scrape off dry mud but wash it off.

b. On pyralin windows and windshields use ammonia and water or approved pyralin cleaners. Some glass cleaners will discolor pyralin.

c. On cabin interiors use vacuum cleaners. It is important that loose objects do not fall into the rear of the fuselage where they may jam pulleys. Do not wear greasy clothing when cleaning a cabin.

d. On engines use kerosene, cleaning solvents put out by various oil companies or chemical cleaners designed for removing grease. Do not use gasoline. Besides the extra expense, gasoline may easily be exploded by such means as spark created by friction of a brush on the cylinder. Occasionally fumes flow a considerable distance along the ground and are ignited by a match lit many feet away.

11. Heading

a. Nothing but the heading will be written in the upper third of the first sheet of each letter. It consists of the following in the order given:

Designation of the headquarters
Reference file number if called for
Post office address
Date
Subject
To whom sent

b. For all letters to be signed by a subordinate, for or by order of a commander, the letter heading used will be that of the headquarters of such commander and it will not contain the title of any subordinate officer.

12. Body

a. The body begins just below the upper third of the first sheet. If a letter has several paragraphs, they will be numbered consecutively in a single series with arabic numerals. If subparagraphs are required, they will be designated as follows, "1" being the assumed number of the paragraph:

1. a. .....
(1) .....
(a) .....

b. The several pages of communication including the pages bearing indorsements will be numbered consecutively in a single series, midway, about one-half inch from the bottom.

13. Signature

a. The signature will ordinarily consist of the first name, middle initial and last name. Signatures will be made with pen and ink, or when necessary, with indelible pencil. Name signatures will be followed by the typewritten name, identical with the signature, followed by the duty assignment and designation of the unit.

b. Except as otherwise prescribed, a commander may require a suitable officer subordinate to himself to sign certain communications for him. When he does so, however, he is as fully responsible for a communication so signed as though he, himself, had signed it.

c. When a subordinate signs a communication for a commander, one of the following forms will be used:

(1) If to a **higher** commander: "For Wing Commander SMITH:
(4 spaces)
John Doe (signed)
JOHN DOE (typewritten)
Adjutant, Wing No. 41."

(2) If to a **subordinate** commander:
"By order of Group Commander SMITH:
(4 spaces)
John Doe (signed)
JOHN DOE (typewritten)
Adjutant, Group No. 512."

e. How to work on airplanes without injuring themselves or damaging the plane.

f. How to do ordinary jobs such as changing tires, cleaning and adjusting spark-plugs, cleaning strainers, etc.

Section III.
SERVICING OF AIRPORT FACILITIES

9. General

Servicing of airport facilities includes custodial duties such as cleaning hangars, as well as service duties such as operating and caring for tractors, gasoline pumps, etc.

10. Hangars

Servicemen may be charged with keeping the hangar in orderly condition. This will include disposal of waste in proper receptacles, knowing where to get tools and supplies and replacing them in the proper location, cleaning and sweeping floors, etc. They should be thoroughly familiar with the operation of the hangar doors.

11. Grounds

Maintenance of the grounds will include repair of fences, clearing away rubbish, and similar work.

12. Equipment

Servicemen should know how to operate and care for equipment such as gasoline trucks, pits or pumps, oil pumps, tractors, and other machinery.

13. Fire Protection

It is of primary importance that service personnel be acquainted with methods of preventing and extinguishing fires.

a. Fire prevention in daily work consists of doing it in a safe manner and avoiding unsafe practices. If an unsafe practice is used often enough, a fire will start eventually. The following are examples:

	Safe Practice	Unsafe Practice	Why Unsafe
(1)	Use of guards on extension lights.	Use of extension lights without guards.	Bulb breaks or overheats fabric.
(2)	Cleaning with non-inflammable fluids or chemicals.	Cleaning with gasoline.	A static or friction spark ignites the fumes.
(3)	Refraining from smoking while working on planes.	Smoking in or near planes.	Glowing ashes fall on inflammable material.
(4)	Care in use of heaters.	Using heaters as convenient to dry dope, etc.	The heat created will set the dope on fire.
(5)	Safeguarding welding operations.	Welding where and as convenient.	Welding is the largest single cause of airplane fires.

b. To extinguish fires, all personnel must know where the extinguishers are and how to operate them. In addition, servicemen should know how to maintain extinguishers in proper operating condition which includes refilling them.

14. Care of Landing Areas

Servicemen, at some airports, help in maintaining the landing area. This work includes mowing grass, repairing of soft or rough spots, examining of hard-surfaced runways, taxi strips and aprons for nails or other tire-destroying objects, and snow removal.

15. Care of Airport Lights

Boundary, flood and obstruction lights may be maintained by servicemen. This work includes replacing of bulbs and other maintenance operations.

TRAINING DIRECTIVE NO. 29
MILITARY CORRESPONDENCE

1. General

The purpose of this course of instruction is to acquaint members of the Civil Air Patrol with the fundamentals of military correspondence.

2. Text

The text material to be used in this course is presented on the following pages.

3. Distribution

Copies of this Directive will be distributed on the basis of four copies per Headquarters.

4. Requirement

All Command and Staff Officers and all other personnel handling Civil Air Patrol correspondence are required to take this course. All personnel concerned with the conduct of wartime correspondence should be familiar with the principles and mechanics of military correspondence.

5. Instruction Procedure

After each member concerned has read and thoroughly understood the text, conferences will be called for at least two class room instruction periods of one hour each, which will include general discussions and question-and-answer periods.

MILITARY CORRESPONDENCE, HOW CONDUCTED

1. Definition

The term "communication" includes official writings such as letters, memoranda, reports, indorsements, and telegrams.

2. Channels of Communication

a. The channels of communication correspond generally to the chain of command as will be noted in paragraph **13b**, below. However, to save time, reduce clerical work to a minimum, and effect decentralization of detail, unit commanders are authorized to correspond directly with the headquarters concerned on matters which pertain to their assigned responsibilities and which do not establish policies. Such correspondence may be with unit headquarters within the Civil Air Patrol or with command, staff or other officers in charge of Civil Air Patrol activities.

b. To the commander lowest in the chain of command who is capable of performing that function, is delegated the responsibility for taking appropriate

action on any matters passing through his headquarters. It is important that every possible effort be made to delegate responsibilities to the lowest echelon which is capable of performing a particular function.

3. Courtesy in Correspondence

Official correspondence should be courteous in tone and free from any expression of a personal nature or that might give offense. Communications should be written according to the accepted rules of good English composition.

4. Replies to be prompt

As a general rule, all official communications will be answered within twenty-four hours. If a delay occurs, the communication will be acknowledged immediately and information furnished as to the cause of the delay and the probable date that reply will be made.

5. Preparation

An official communication will refer to one subject only. Letters of transmittal will be used only when necessary, and when used will refer only to the matter transmitted; none are required with routine reports, requisitions, etc.

6. Letter-size paper

For all letters the paper used will be 8 x 10½ inches. When more than one sheet is used for a communication, including indorsements thereon, all will be of the same size. One side only of the paper will be used.

7. Unused margins

Unused margins of not less than the following widths will be left in each communication:

Top margin, first page	1 inch
Top margin, second and succeeding pages	1¼ inches
Left margin	1 inch
Right margin	¾ inch
Bottom margin	1 inch

8. Folding

Letter paper, ordinarily, will be folded in three equal folds, parallel with the bottom, the lower fold over the face of the letter and the top fold toward the back of the letter.

9. Spacing

When typewritten, the body of a communication will ordinarily be single spaced with a double space between numbered paragraphs.

10. How arranged and fastened

For other than filing purposes the several parts of a communication ordinarily will be arranged and fastened together in the following order:

a. Original with pages in numerical sequence followed by original indorsements in numerical sequence, except that the last indorsement with copy or copies thereof will be on top.

b. Copy or copies, if any, of the basic communication followed by copy or copies, if any, of indorsements except the last, in numerical sequence.

c. Inclosures, if any, in numerical sequence.

P-01

"Only Four Minutes More and We'll be at Rickenbacker Field!"

Family flying is just around the corner. After the war is won, family planes will become as popular as family automobiles.

Rickenbacker Field is ready for that day. Newest and largest airport serving metropolitan Atlanta, and one of the finest in the nation, it offers the very best of facilities and equipment for storage, overhaul and maintenance.

Georgia Air Service, Inc., now operates two Army Air Forces Flying Training Detachments, where [SECRET] Army planes are kept flying [SECRET] hours per day by our skilled mechanics and flight instructors. This background of experience and the services of our trained personnel will be available to the "family flyers" of the future as we operate this Cobb County Airport, appropriately named "Rickenbacker Field."

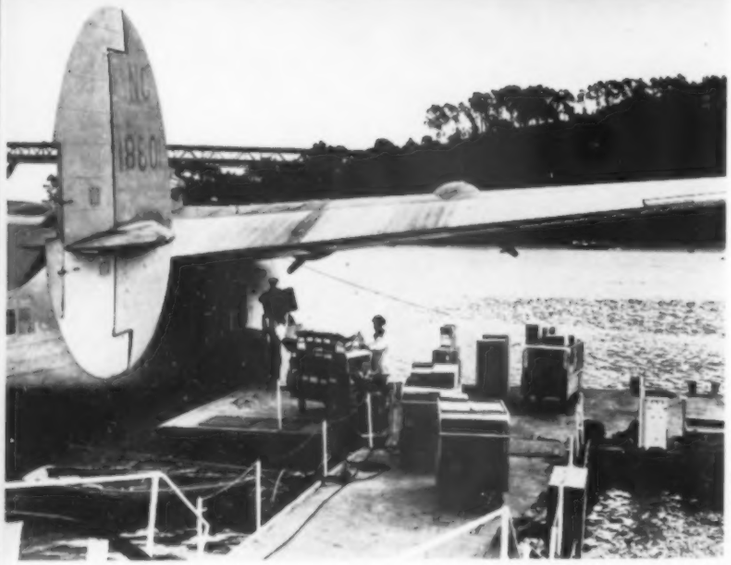
GEORGIA AIR SERVICE

GEORGIA AIR SERVICE, INC.

ATLANTA, GEORGIA

Flight Contractors to U. S. Army Air Forces, Bennettsville, S. C., and Jackson, Tenn.

Lessee-Operator Rickenbacker Field (Cobb County Airport)



PAN-AMERICAN CLIPPERS CARRY CARGO in addition to mail and passengers on transoceanic routes. This photo shows war goods being loaded at a Pacific base. Panagra last month inaugurated the last leg of a 5,300-mile air cargo service, longest commercial sky freight line in the world, stretching from the Panama Canal Zone down the South American West Coast and across the Andes to Buenos Aires. Douglas DC-2's carry as much as ten tons per week and average about 3,300 pounds of cargo.

Background for AIR CARGO

By RALPH E. OURSLER

Chairman, Statistics and Research Committee, Air Cargo Research Association

Authentic facts and figures are determining the development of air cargo. Balance your outlook with these timely contributions from the Air Cargo Research Association.

THE growth and expansion of aviation has been gradual until the first of this year. Especially from the standpoint of carrying large pieces of freight by air. Since we entered fully into the world war, aviation has rushed headlong to such an extent that most experts believe it has crammed twenty-five years of normal growth into the space of a year. So our ideas and outlooks of six months or a year ago have had to undergo radical changes. This is true in airplane design as well as in airline operations.

Soon after Pearl Harbor it was apparent that supplies, troops, etc., must be moved to combat areas with the least possible delay and also with a minimum amount of losses. So many ocean-going vessels were being lost due to the submarine menace, it was evident that strategic supplies must be transported by air to assure their safe arrival.

Airlines Convert for Cargo

Early in 1942 executives from our commercial airlines were called to Washington and at this time were told of the job to be done. That of an all-out effort to lend their services to help win this war. Immediately each executive pledged 100% co-operation and at the present time each line is doing a splendid job of delivering needed materials to all points on the globe.

Many of their luxurious liners were stripped of their sofa chair and comfortable interior design, and practically overnight converted to flying box-cars. Regular freight schedules were set up both for foreign and domestic operation. Today, right at the moment in fact, a large number of these airplanes, in addition to many new designs recently manufactured for the sole purpose of carrying large loads of freight, are in the air, transporting aircraft parts, repairs, engines, serum, and many other items essential to the war effort. These planes are destined to all ports of the world and are piloted by experienced men accompanied by young co-pilots, who are receiving valuable experience that will make them comparable to these senior officers and from this training will become our leading flyers in the post-war period.

This brings us up to the important part that Air Cargo is playing in today's war drama and the part that it will play in tomorrow's life of freedom. After peace has been won there will be many items subject to shipment by air that have never been considered for this mode of travel.

This brings up the question of costs in comparison with railroad and truck rates. I do not intend to predict that rates will be equal on like shipments; however, with airplane costs decreasing along with operating costs it is apparent that rates will be more competitive than in the past. There will be plenty of freight for all to carry and it is important that railroads, truckers and airlines co-operate to arrive at favorable results that will be profitable for all concerned.

Analyzing Cargo for Air

In 1941, Class 1 railroads originated 1.2 billion tons of freight. Of this amount 684,000,000 tons (55%) constituted coal, ore and other products of mines which, on cost basis, would not be shipped by air.

An additional 189,000,000 tons consisted of products of agriculture, animals and products and forest products which also to a large degree will not be subject to air shipment in the near future. From this latter classification, perishables, fruits, meats, etc., will be eligible for air shipment, and foods generally, particularly if strides are made in dehydration.

The bulk of rail and truck freight which would be subject to air freight competition would be in the field of l.c.l. and manufactures and miscellaneous items which in 1941 amounted to 354,000,000 tons for Class 1 Roads or the equivalent of less than 30% of total rail tonnage originated.

Assuming the industry has 1,000 planes of 20-ton capacity devoted entirely to air freight, this would mean an airplane freight capacity of 20,000 tons vs. railroad industry's aggregate

(Continued on page 28)

Flight Commanders to Dodos Know

RYAN BUILDS WELL!

CONFIDENCE for the student pilot, incentive for the instructor, comforting assurance for those at home—all result from the knowledge that Ryan builds airplanes well. In the services of the U. S. Army, U. S. Navy and United Nations, Ryan Primary Trainers are daily proving to be the world's finest. Vital as trainers are to achieving victory, building them well and in volume has been only part of important Ryan war assignments.

WHEN PEACE COMES, American industry will be ready with many wondrous products to make this a better world. Then, whatever Ryan Aeronautical Company offers for your better air transportation, remember, "Ryan Builds Well."

RYAN AERONAUTICAL COMPANY, San Diego, Calif. **Member, Aircraft War Production Council, Inc.**

Ryan Products: Army PT-22s, Navy NR-1s, Army PT-25s, Major Sub-Assemblies and Exhaust Manifold Systems for America's Most Distinguished Aircraft

Training the CLIPPER PILOTS

with

JACOBS AIRCRAFT *Engines*

Long before the day when he took the controls of this huge skyliner, the Clipper Pilot served an apprenticeship exacting in the extreme—an apprenticeship of countless hours aloft, under every conceivable condition, flying mostly "on instruments."

This comprehensive training requires Training Planes powered by the most reliable of engines.

Pan American Airways Clipper Pilots—like our Army Bomber Pilots—are schooled in twin-engine Trainers powered by JACOBS.

Pan American Airways Jacobs-powered Cessna.

JACOBS AIRCRAFT ENGINE CO.

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—*Army Air Forces Photos.*

THREE-QUARTER FRONT VIEW shows front fuselage resemblance to heavy glider. Warner engine powers three-bladed rotors for lift and steering. Length is thirty-eight feet, height twelve, with gross weight of 2,400 pounds.

The Helicopter Goes to War

THE Army Air Forces have developed a helicopter to provide a heavier-than-air medium operating along lines radically different from those of the standard airplane and at the same time providing definite and practical flying characteristics of military value. Known as the Army-Sikorsky helicopter, the basic model of the new aircraft was designed by Igor Sikorsky in 1939 and demonstrated by him in 1940.

In 1941 the Air Forces placed an order for one experimental model which when completed was flown the 761 miles between the company plant and Wright Field where it was delivered for test in May, 1942. These tests have been sufficiently successful so that a production order has been placed with the Vought-Sikorsky Company and with delivery of the production models the craft will be subjected to further tests under actual field operating conditions.

20-Year Background

The word "helicopter" is not new in the annals of flight. Conceptions of aircraft, in fact, having helicopter characteristics are far older than the airplane itself. The bibliography on the subject is voluminous and hails practically from all civilized countries. An especially active period concerned with the type hinges about the years 1920-23 and various flying models were built at that time for which more or less extravagant claims were made. The Army Air Forces was among those interested and sponsored a development by Dr. George de Bothezat, who at McCook Field, constructed a helicopter which was actually flown. But it was not considered sufficiently practical for continued development. Interest in the type, however, never became dormant and attempts to achieve as nearly as possible vertical ascent and hovering characteristics found expression principally in the liaison airplanes and autogiros, now in actual use.

What may be termed the first successful helicopter was developed by

ARMY MODEL hovers in pose often used by Igor Sikorsky.

Professor Focke in Germany in 1937, when he astounded the world by flying his model inside a crowded sports palace. Little, however, has since been heard of this craft, perhaps because of the war, perhaps because of inherent weakness of design.

The Sikorsky helicopter was conceived along quite different lines and the present Army model, due to combined Air Forces and company cooperation, has been considerably simplified and improved over the original Sikorsky prototype. Further improvements in construction as well as performance characteristics will be incorporated in the production models to come.

Features Listed

The fuselage is without wings. The front has somewhat the square-faced appearance of a taxicab. Aft it lifts sharply to provide clearance for the rear rotor. Of welded tubular construction, the rear section at the tail is left uncovered. Two rotors (or propellers) are installed; one approximately thirty-six feet operating in the horizontal plane on top the fuselage, one of seven and one-half feet in a vertical plane at one side of the tail. The full lift of the helicopter is obtained from the horizontal rotor.

Power is furnished by a seven-cylinder Warner radial engine by gear and shaft transmission to the two rotors. The main landing gear presents a bow-legged appearance, strut-braced at the sides of the fuselage well back of the cabin. Side-by-side seats accommodate a pilot and passenger or crew member. Approximate length is thirty-eight feet and height twelve feet. Gross weight is 2,400 pounds.

In the development and procurement of the helicopter the Army Air Forces has immediate and realistic motives. For liaison and message carrier behind the combat lines, its value is

(Continued on page 36)

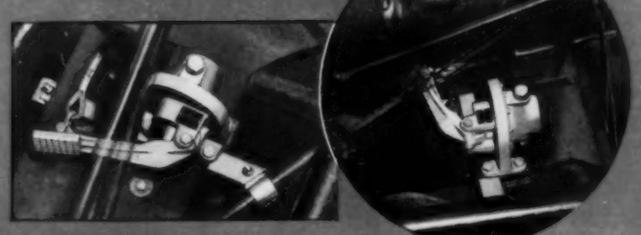
TAIL IS LOW in photo showing flight.

This Space Contributed by SOUTHERN FLIGHT

IT'S SMOOTHER, SURER STOPS WITH THE NEW SCOTT "B-711" BRAKE PRESSURE UNIT

There's a real feeling of confidence when your heels engage the pedals of the newly-developed Scott Brake Pressure Units. You ***know*** you come to a smooth, safe stop when and where you want to. That's because these new hydraulic pressure cylinders are positive in action—absolutely fluid-tight—assuring top efficiency from the brake system. Designed for use on light aircraft using the expander tube brakes, these units may be adapted to other braking systems. Readily installed, and located with pedals in conventional relationship to the rudder pedal. Scott B-711 Brake Pressure Units are simple in design, durably constructed, light in weight (only 21 ounces). Each unit is exactingly tested to assure dependable, long-term performance. Economically priced. Write for illustrated folder.

The illustrations below show the locating and simple method of installing the pressure unit in the brake system: (1) Installation on Piper J-3 with floorboards removed showing method of reinforcing and attachment to structural members of fuselage. (2) Close up of left-side pressure unit showing cable extension to front seat brake pedal and attaching clamps. (3) Convenient arrangement of pressure unit pedal, located for easy, positive operation.



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SUPPLIERS TO THE U. S. ARMY AND NAVY AIR FORCES AND LEADING AIRCRAFT MANUFACTURERS

—Photo by Co-ordinator of Inter-American Affairs.

RUBBER FROM CENTRAL AMERICA is a big cargo item for Army freight planes, which have flown over 100 tons of the crude between December, 1942, and February, 1943. Half originated in Panama, most of the rest from the Canal Zone, Nicaragua and Guatemala. Rubber seized from the enemy and "tree scrap" from the wild Castilloa trees furnished the tonnage. Hundred-pound bags flown north are consigned to San Antonio, Texas, where 4,000-pound loads are frequent. Airplanes also are flying crude rubber to the U. S. from South America's rich Amazon basin.

AIR CARGO

(Continued from page 22)

box-car capacity of 33,000,000 tons. Truck capacities vary; however, it would probably be in the neighborhood of 20,000,000 tons. The speed factor must, of course, be taken into account; not only will the plane make more and faster rips, but the shipper will probably be willing to pay a premium for speed.

It has been estimated that the volume of domestic air cargo could increase 100-fold and yet capture only 1/10 of 1% of the freight ton miles now carried by American railroads and trucks.

Carriers Should Co-operate

These statistics prove the importance of close co-operation between all carriers, which includes the steamship companies as well as the railroads, truckers, and airlines.

Many large trucking companies have for some time been studying the possibilities of entering the air freight business in the post-war period. These companies are wise and undoubtedly are pointing in the right direction. However, an alternative course of procedure would be for the airlines and the trucking companies to pool their knowledge and study the opportunities that are available for quick carrying of freight by air and speedy pick-up and delivery service from the shipper to the carrier and from the carrier to the shipper. It might be more profitable and each concern would still be in the field that it is best fitted for.

Keep in mind that air freight cannot be successful without a well knitted pick-up and delivery service.

As an example, we might follow a shipment from New York to Los Angeles. Unless service is well planned the following would happen:

Mr. Jones in New York calls an independent trucking company to deliver a package to the airport whose destination is Los Angeles. The trucking company receives the call at 3:00 p. m. and finally picks up the shipment just before closing time at 5:00 p. m. Since they have nothing else to go to the airport the shipment spends the night on their dock in New York. The next day it finally gets to the airport and fifteen hours later arrives in Los Angeles, California. Now, instead of being delivered immediately to its consignee, it spends another day at the airport until a few other shipments arrive that are to be delivered in the same part of the city. Three days have elapsed before the shipment actually is delivered to the consignee. This is still faster than rail or truck, but it isn't the service to which the shipper and consignee are entitled.

International Field Promising

If the truck service was a part of the air carrier the shipment would certainly be treated as follows:

Mr. Jones calls the airline in New York at 3:00 p. m. Friday to ship a package to Los Angeles. A truck picks up the shipment immediately and delivers it to the airport. At 5:00 p. m. the package is westbound for Los Angeles, California. By taking advantage of gaining time when traveling west, the airplane arrives in Los Angeles fifteen hours later or at 5:00 a. m. Saturday, Pacific Time. The shipment leaves the airport immediately by truck to its final destination and when Mr. Smith arrives at his office at 8:00 a. m. the package is there to greet him.

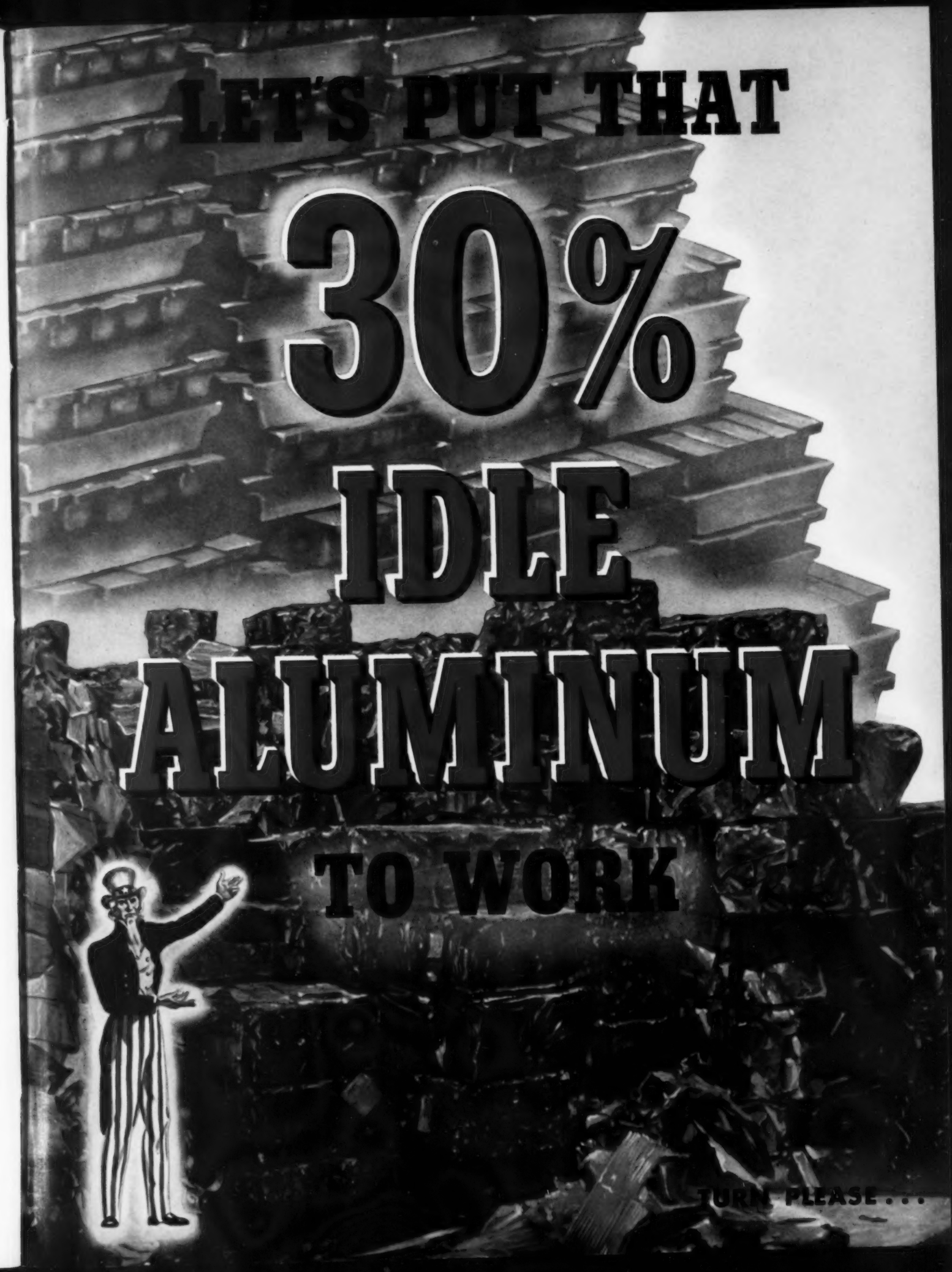
This is the kind of service that will make air freight profitable for the operators.

The same example would apply for shipments to smaller towns not directly served by air.

In conclusion, I might say that the first real mass demonstration of the ability of the airplane to handle commercial cargo on large scale will come in the international field, for here should be the largest demand when the fighting ceases. The airplane is already carrying a sizeable volume of cargo to England, to Africa and other points, and by the time the war ends the figures will be most impressive. Perhaps one of the most interesting developments is the plan to transport rubber direct from the Amazon regions to the processing factories in Ohio.

From a cost standpoint, you may well remark that today in the midst of war, cost is no element in moving vital war goods and this is perfectly true. But airplane costs are beginning to go down, and will decrease sharply at the war's end. The rubber that will be transported by air from South America could be transported much cheaper by slow river boat to an ocean port and brought to the United States by ocean freighter, thence transferred to rail if the shipping facilities were available. But by the time the war is over, it is very doubtful if rubber will be transported by that slower method. For one thing, transportation by air direct from source to factory saves handling costs. The trip can be made from the heart of the Amazon to the factory in Ohio with but a few refueling and servicing stops. Speed of shipment is likely to be more of a factor than many of us realize.

(Continued on page 42)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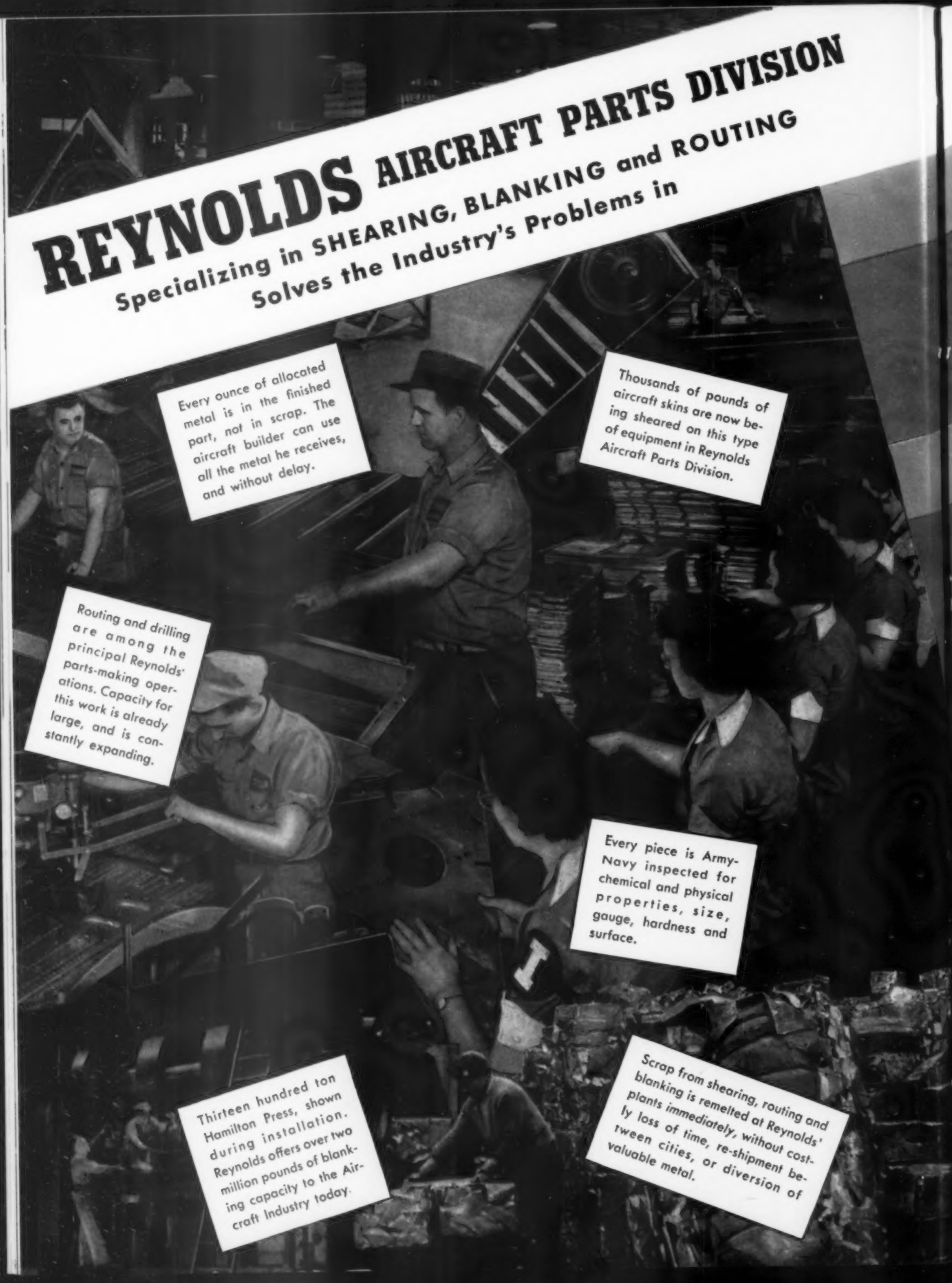
30%
IDLE
ALUMINUM
TO WORK
TURN PLEASE . . .


REYNOLDS AIRCRAFT PARTS DIVISION
Specializing in SHEARING, BLANKING and ROUTING
Solves the Industry's Problems in
Every ounce of allocated metal is in the finished part, not in scrap. The aircraft builder can use all the metal he receives, and without delay.
Thousands of pounds of aircraft skins are now being sheared on this type of equipment in Reynolds Aircraft Parts Division.
Routing and drilling are among the principal Reynolds' parts-making operations. Capacity for this work is already large, and is constantly expanding.
Every piece is Army-Navy inspected for chemical and physical properties, size, gauge, hardness and surface.
Thirteen hundred ton Hamilton Press, shown during installation. Reynolds offers over two million pounds of blanking capacity to the Aircraft Industry today.
Scrap from shearing, routing and blanking is remelted at Reynolds' plants immediately, without costly loss of time, re-shipment between cities, or diversion of valuable metal.

SCRAP UTILIZATION . . . Fully 30% of all aluminum sheet is lost in making aircraft parts. Reynolds puts this scrap metal back into use at once, *at the aluminum source*— eliminating months of storage, tedious segregation and handling, costly shipping, labor, and plant space. The Nation needs these extra millions of pounds of aluminum *now!*

MANPOWER . . . Under the Reynolds' Plan, every piece of aluminum the plane builder receives is in *finished parts*, ready for assembly. Aircraft plants need not tie up their own precious skilled labor making dies and fabricating individual parts. Reynolds is prepared *now* to handle this work, leaving the plane builders free to *build* planes!

TOOLMAKING . . . Parts to supply several aircraft plants building similar planes can be produced by Reynolds Aircraft Parts Division from *a single* set of tools. Wasteful duplication of both labor and materials in the critical tool-making field is eliminated.

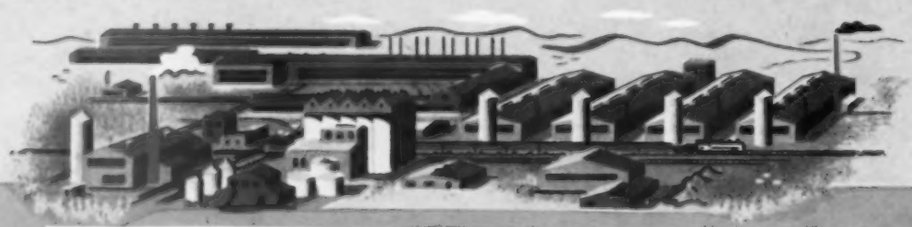
TRANSPORTATION . . . Fabricating parts and handling scrap *at the aluminum source* releases for other war production duties the thousands of freight cars formerly required to haul scrap metal back from aircraft plants. Using Reynolds' parts-making facilities helps break the transportation bottleneck!

TURN PLEASE . . .

"HISTORY"

France, England and America ignored for five years the sensational increase in production of Aluminum Metal by Germany and her allies. This tragic failure doomed France and tragically threatened England. Uncle Sam at last placed his fighting fist squarely around America's greatest bottleneck — aluminum. Of course, the spirit of defeat cried aloud "It's not needed." Timid little devils of fear thought a thousand petty reasons why it should not be attempted. Uncle Sam has often laughed at timidity. He has learned that the spirit of offense is never conquered, that the fighter with the initiative never loses. He reasoned that this is a light metal war. That it will be won or lost in the air. To Uncle Sam nothing else mattered.

Today there remains still another bottleneck to be broken in the aluminum industry — that 30% of idle metal tied up for months at a time in the form of scrap in transit, at plane plants and in junk yards throughout the nation, awaiting re-processing. This priceless aluminum is thus diverted from plane production at the most critical moment in our history. With its newly expanded Aircraft Parts Division, Reynolds Metals Company offers to aircraft manufacturers everywhere a way to smash this bottleneck — *NOW!*



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REYNOLDS METALS CO.

FOR WAR TODAY · FOR PEACE TOMORROW · REYNOLDS ALUMINUM

PROMISE OF AIR POWER

(Continued from page 20)

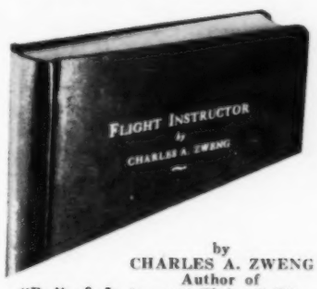
which it used for cover. Germany's *stukas* later employed similar tactics against Poland, although they performed more angular dive bombing than horizontal strafing with bombs and guns. The Spanish Loyalists, although ill-equipped with assorted types of planes, duplicated U. S. attack aviation at Guadalajara and routed a strong mechanized attack by Fascist ground forces.

Justification for Day Bombing

Bombardment aviation in the GHQ Air Force was designed to operate at high altitudes over heavily-defended target areas such as warships and industrial cities. Altitude offered protection from enemy pursuit aviation and ground fire. GHQ bombers operating at great distances would not be escorted by fighters because long-range fighters were inconceivable. Altitude demanded almost incredible accuracy, and American genius at the Air Corps Materiel Division at Wright Field worked ceaselessly to provide that accuracy, eventually perfecting the famous Norden bombsight. Night bombing from high altitudes, obviously impractical, was given much consideration, with several ingenious devices being developed to further it, including high-powered parachute flares. But day bombing was favored, especially in view of possibilities of equipping large bombers with multiple defensive guns. In maneuvers the rules required two or more fighter planes to attack a bomber simultaneously before a kill was allowed, and bomber formations were considered safe unless attacked by superior numbers of fighters and scattered. At one phase of the development the 20th Pursuit Group experimented extensively with time bombs, dropped from above bomber formations and calculated to explode within shrapnel distance of the big ships. If heavy bombers were so difficult to down, they could operate without escort in daytime; such reasoning strengthened the American viewpoint as the B-17 became more and more formidable.

Part II of The Promise of Air Power will appear in the April issue of SOUTHERN FLIGHT.

FLIGHT INSTRUCTOR



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CHARLES A. ZWENG
Author of
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Other new features include flight examiners and methods of grading. A new section covers information concerning Load Factors. Typical flight instructor's examinations "multiple choice" are covered in the last section. 480 pages handsomely bound in blue leatherette with gold letters. Price $4.00 postpaid or C. O. D.

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★ PRODUCTION

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DALLAS, TEXAS

THE CAA War Training Service (formerly known as the Civilian Pilot Training Program) will continue — the rumor that it will be taken over by the military has no factual foundation. The Service is and will continue to be the contracting agency through which flight instruction contractors will deal in respect to all matters having to do with the conduct of pilot training programs for the Army and Navy at centers where such

The situation, says Director Stewart, was wholly beyond CAA control. To keep the record straight, we present an official statement going into details to explain the rapid changes which the War Training Service is undergoing.

The CAA Explains Itself

By R. McLEAN STEWART,
Executive Director of Training,
Civil Aeronautics Administration

training is now being provided under the supervision of the Civil Aeronautics Administration.

The manpower directive of December 5, 1942, prohibiting voluntary enlistment, ended the arrangements under which it had been possible for the CAA War Training Service to find and supply men to be enlisted in the Air Corps Reserve to be trained on inactive status as service pilots for the Army. This situation was wholly beyond the control of the Civil Aeronautics Administration. It made necessary the search for a way in which the available civilian training facilities might continue to be used advantageously for the purposes of the training programs for the Army and Navy.

Effective December 15, 1942, the Navy placed on active duty all Naval personnel undergoing pilot training supervised by Civil Aeronautics Administration. At that point, the program which was being conducted for the Navy ceased to be a civilian pilot training program and became definitely a war training program for men who were on active duty as members of the armed services.

We are now assured by the Navy that no change is contemplated in the arrangements which have governed the conduct of the training program for Navy during the past several months.

On January 19, 1943, an arrangement was concluded with the Army Air Forces whereby a minimum of ten hours of elementary flight instruction is to be provided each month by CAA War Training Service for one-fifth of the number of AAF aviation cadet candidates who are to be placed in the colleges by the Army for academic instruction. It is our understanding that if it proves possible to provide this flight instruction in an efficient and satisfactory manner and if the facilities for additional instruction are available, the Army Air Forces may desire to arrange for flight instruction beyond the minimum of ten hours.

It is expected that academic training will begin not later than March 1, and elementary flight instruction on March 31.

Equipment, Parts Situation

Selection of the flight contractors who are to be asked to provide flight instruction in conjunction with the Army's college program cannot be made until the Army has definitely selected the colleges which are to be used for its academic training program. Colleges chosen will be those within reasonably easy access of airports at which, in the opinion of the CAA War Training Service, it will be possible to provide the facilities required for the new flight training program.

It has long been recognized that the existing stock of small planes in the hands of private owners is a valuable military asset, and that the owners of these planes would gladly and unhesitatingly embrace the opportunity of having their craft called into essential war service.

As soon as it was seen that the magnitude of the new program contemplated by the Army would necessitate the acquisition of additional planes for training purposes, the War Production Board took action through a general limitation order to facilitate the acquisition of such planes at fair prices.

There has never been any intention of buying up the planes of flight contractors which are already being used in the war training program for Army and Navy at points where they can continue to be used efficiently in that training program.

But it is quite clear that the planes which are required to provide elementary flight instruction for aviation cadet candidates must be assembled quickly at designated centers. To insure that they can be made available without delay, arrangements have been completed to effect the purchase through Defense Plants Corporation of all aircraft which are essential to fill the needs of each training center. However, if a training center possesses or can acquire the necessary number of planes meeting the specifications of the training program, our policy not only permits, but encourages such action.

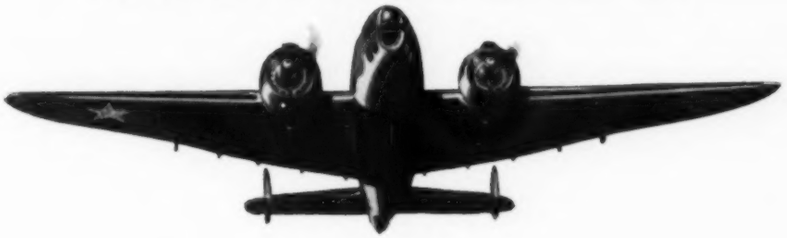
The prices at which planes may be purchased will necessarily be governed by the fair market value of the planes as determined by reference to manufacturers' list prices as of a stated date, with due allowance for depreciation and related factors. It is our understanding that private transactions in small planes, to the extent to which they may be authorized by the War Production Board will, in effect, be subject to a price ceiling determined by reference to the same basic formula.

Planes which are purchased through Defense Plants Corporation will be leased to the CAA War Training Service, which will in turn assign such planes under license to be used by contractors exclusively for the purposes of the authorized war training program.

Contractual arrangements covering elementary flight instruction for aviation cadet candidates will be substantially the same as those which have hitherto applied to contracts governing elementary flight instruction, necessary adjustments being made to bring the payments into line with the limited amount of flight instruction initially authorized for each trainee. Where planes owned by Defense Plants Corporation are supplied to the con-

(Continued on page 36)

Bruiser



This is the Vega Ventura, a tough looking, tough acting new bomber with some definite family characteristics. It *looks* like the Hudson only bigger. It's sleek and powerful, with stamina in every spar. It acts like the speedy, record-breaking airline Lodestar only faster and more maneuverable. In action it's a *bruiser*, the biggest, hardest-hitting bomber yet designed and produced by Vega. It carries a bellyful of destruction in its whopping bomb bay and throws 50 caliber death from five gun positions.

United States and Royal Air Force pilots can tell much more about this deadly bomber in the days to come, and they *will* in stories of blasted Axis supply lines, smashed Axis tanks and silenced Axis guns.

A subsidiary of Lockheed

Vega

Aircraft Corporation

Copyright, 1943, Lockheed Aircraft Corporation, Vega Aircraft Corporation, Burbank, California. Members Aircraft War Production Council, Inc.

CAA EXPLAINS

(Continued from page 34)

tractor, a deduction to cover the rental value of such planes will be made from the rates which would prevail if the contractor had used and supplied his own planes.

The contractor will be responsible for the maintenance of planes supplied to him. All such planes are to be properly insured. In part, this insurance will be arranged for by CAA and Defense Plants Corporation. Contractors will make their own arrangements for additional insurance to cover their own specific liabilities.

We have been definitely assured that the materials and parts required to maintain in safe and efficient flying condition all of the operating planes to be used in the war training program will be scheduled for production and will be made available through the agencies controlling aircraft priorities and production. The release of these parts and materials carries with it the definite obligation of reserving all such planes exclusively for the purposes of the authorized program.

Many Problems Involved

Completion of the training of the Air Corps enlisted reservists on inactive status who were enlisted or who began training as non-combat service pilots is in itself a major undertaking. It is planned to carry forward all of the men who can successfully complete the courses until they have, at least, been graduated from the cross-country course or, with respect to more than half of the available men, until they have been graduated from the secondary instructor course.

The question has been raised whether these men should be compensated while undergoing training. Funds for such a purpose have not been appropriated by Congress, and the CAA War Training Service can therefore take no action in the matter.

The non-combat service pilot trainees constituting this group will not be assigned to training at centers which are selected for the training of aviation cadet candidates. To do so would place too great a burden on the facilities available at such centers.

It is planned to select certain centers which can be equipped efficiently to handle flight training and instruction in the cross-country, link instrument, and instructor courses. This will involve a certain amount of centralization. Experience in recent months has shown all too clearly that it is not possible to handle maintenance problems satisfactorily in a war economy when training operations involving the use of advanced training planes are widely scattered among large numbers of small centers.

Selection of the centers to be employed for the purposes of the advanced course cannot be completed until the use which is to be made of colleges by the Army and Navy for the purposes of the war program generally has been brought to final determination. It is hoped, however, that prior to the first of March these choices will have been made.

It is not possible at this moment to say how many colleges will be employed by the Army in its aviation cadet candidate training program, nor how many related flight training centers will be employed by CAA. It will be noted, however, that a list of 150 colleges was published in the press on February 7. The War Manpower Commission has stated that these colleges, if found satisfactory, are available to the War Department for the training of Army aviation cadets. It is our view that in addition to the colleges and flight training centers which may be required for the purposes of the cadet candidate program, at least thirty to thirty-five major training centers will be required to handle the advanced courses for the reservists on inactive status who are being trained for employment as non-combat service pilots or as instructors.

We have the assurance of the Army that if the centers which are established to provide training in the advanced courses prove efficient in their performance, considerations will be given to means by which continued utilization of their facilities can be arranged when the supply of graduates of the secondary course is no longer adequate.

Training for Women Wanted

The training program immediately in hand, therefore, will tax to the utmost the abilities and resources of all flight instruction contractors who are in a position to contribute efficiently to the war training program. Those who cannot be employed in the program on a direct contractual basis will find that their services and those of their instructors and mechanics are urgently needed in the program, either to assist other contractors or to work directly with the CAA War Training Service in a supervisory capacity as flight or maintenance inspectors.

Over and above all this, as we look ahead, it is clear that as soon as arrangements have been completed satisfactorily to handle the programs already in hand, it will be desirable to take steps to insure the continuity of a supply of civilian instructors and pilots by arranging for the use of such facilities as can be made available for the training of such pilots.

We believe also that a training program for women is desirable.

The need for trained mechanics is very much in our minds, and it is our intention, when the training centers are set up to handle the pilot training programs outlined above, to make such arrangements as may be possible for the training of mechanics at these centers.

We cannot hope to place the civilian facilities for pilot training on a definite war footing without effecting certain dislocations. Everyone involved is impatient to know where he will fit into the program in its new phase. You may be sure that we are equally anxious to make the information available.

In time of war there is one paramount consideration which must be given precedence over all other considerations—the needs of the war program of the armed services. To them is given the heavy task of conducting operations. They fight the battles. They best know how and where we can aid them in their task. When called upon to perform a service for them, we on the civilian front must respond to the utmost limit of our strength and resources. We have no claim to recognition except as we currently perform a service which makes an essential and efficient contribution to the winning of the war.

HELICOPTER GOES TO WAR

(Continued from page 25)

obvious. A telephone line dropped from the craft to the ground would make possible the personal delivery of messages in inaccessible spots without the necessity of its landing.

A further important use is seen in its adaptation as an aerial ambulance equipped with litters for the removal of injured from jungle or other remote areas often virtually inaccessible to ground crews, or to be reached only by long and arduous effort. There are several recent instances in the case of crashed bombers where if a helicopter had been available, rescue could have been accomplished in hours rather than days, and the injured crew members been transported promptly to base hospitals.

The fact that it could operate from any ship deck large enough to accomodate its bulk opens up further vistas of possibilities.

UNCENSORED
REPUBLIC P-47
THUNDERBOLT
SPEED . . . . . 400+ m.p.h.
DIVE . . . . . 725 m.p.h.
CEILING . . . . . 40,000 ft.
ENGINE . . . . . 2,000-h.p. radial
PROPELLER 4-blade
FIREPOWER . . . . 8 50-cal. guns

The Axis Knows!... The cunning minds of the Luftwaffe and the Kokutai know to a certainty that *Republic P-47 Thunderbolt* squadrons can annihilate opposing formations. They're *not* happy about these high-altitude blitz-busters of the U. S. Air Forces!

REPUBLIC AVIATION

REPUBLIC AVIATION CORPORATION — FARMINGDALE, L. I., NEW YORK

AT-6-TYPE TRAINERS, manufactured in the North American Aviation, Inc., factory at Dallas, include large quantities made for Canadian and British Air Forces. Propellers for many are made by Canadians in Montreal and shipped to Texas for installation.

CANADA HELPS DELIVER *Texans*

By ESTHER H. FORBES

WITH all the talk about Lend-Lease and this country's aircraft shipments to Great Britain, China and Russia, few people realize that one of our allies is producing aircraft parts for shipment to us. Yet Canadian Propellers, Ltd., in Montreal, Canada, is working twenty-four hours a day turning out propellers to drive American-built *Texan* trainers.

The story of Canadian Propellers is as amazing as that of any American aircraft company. It is not one of expansion or of conversion, however, but of starting from scratch. In less than two years a few acres to the east of Montreal have been transformed from snow-covered meadow to a thriving arsenal of democracy.

Before 1941, not a single metal propeller plant existed in all Canada. Wishing to make up in part, at least, for this great lack, the Canadian government asked James Young, president of Canadian Pratt & Whitney Aircraft Company, Ltd., to start a propeller plant in addition to his engine factory and overhaul shop.

Young moved fast. Immediately he consulted the management of United Aircraft Corporation, the parent organization, and received from them a license to make Hamilton Standard propellers without paying any royalties or license fees. On April 1, 1941, Canadian Propellers, Ltd., was formed as a subsidiary of Canadian Pratt & Whitney with Young as its president, on June 8 ground was broken, on November 7 the first employes moved in, and on February 22, 1942, the first propeller was finished.

It was not only the plant but the whole organization that Young had to build from the bottom up. He had to assemble a group of men and women who had never worked together, and build up an *esprit de corps*. He had to train these men and women—local Canadians, none of whom had worked in a propeller plant and many of whom had never worked in a factory—in the art of making propellers, one of the most difficult in the aircraft industry. He had to find draftsmen to make the 12,000 drawings needed for the Hamilton Standard controllable pitch propeller. He had to buy all the machinery and materials.

In the whole organization, only one man had ever worked for a propeller company before. This was Alan G. Day, who came up from Hamilton Standard Propellers in East Hartford, Connecticut, to be the chief engineer of the company, and who was, and still is, the only American there.

Under Day's guidance, the first employes learned how to operate their machines and how to polish and balance propeller blades. Those who showed special aptitude were sent down to Connecticut to learn all they could about the production of propellers. Upon their return, they were put in charge of small groups of men and women in their departments. Since then all key employes have visited the Hamilton Standard plant in order to find out new ways of improving their work.

Twelve-Hour Shifts

In addition, Canadian Propellers opened a technical training school on January 22, 1942. The aim of this school is to train its students in the basic rules for operating one machine rather than to make them full-fledged machinists or toolmakers. By thus cutting down the time required for training, the school has consistently provided enough competent workers to fill vacancies and to man the new machines which the company receives on a priority rating from Washington.

In spite of the company's youth, morale has not been a problem for Young, who is an Englishman and a strict disciplinarian. At the outset he made certain hard and fast rules. As a result, the employes respect him. Moreover, they work ungrudgingly from 7:30 to 7:30, day or night, with only one thirty-minute and one fifteen-minute period out for lunch and a snack. For the rest of the day they concentrate on their work.

In certain respects, the company's youth is a decided advantage. Starting from scratch as they did, Young and his associates were able to design the plant as they wanted it. In their plans they were able to provide for a first aid room near the shop and for two large, quick-serving cafeterias. In laying out the shop, they distributed the machinery in the best possible way. For instance, balancing a propeller is an extremely delicate operation, and the slightest stirring of the air may throw the calculations off. Therefore, Canadian Propellers has set up for the operation a narrow passageway where no draft can enter, between the back wall and a curtain which is drawn during the balancing.

Particularly striking is the new ap-

LATEST improvement to AT-6-A is unique wooden ski landing gear, which retracts to allow use of wheels. This one's flying over sunny Texas on test flight.

pearance of all the equipment. All of the machines have come directly from the manufacturers and are still bright and shining. Of course, there are a tool room and a gage inspection department which keep the machines in condition. Canadian Propellers mechanics are fortunate in having the most modern tools available to work with, and they have every reason to do a first-class job.

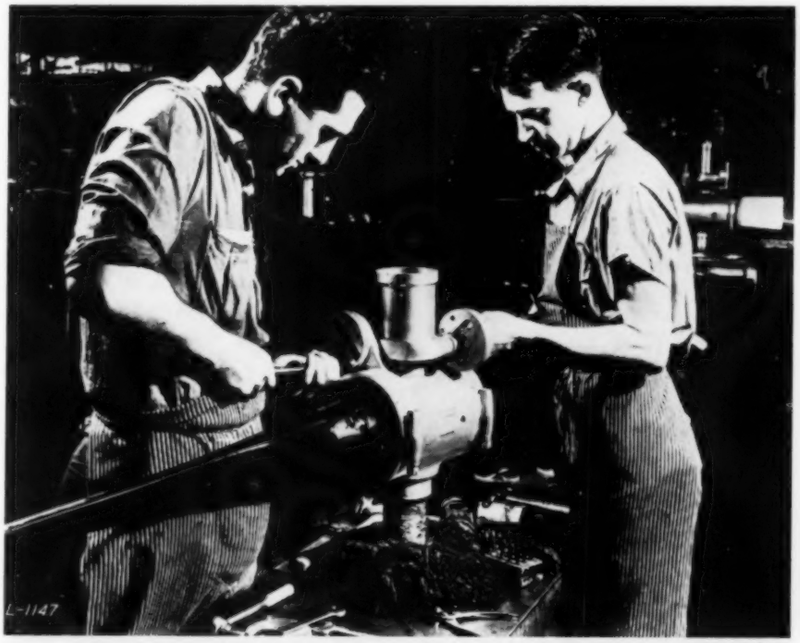
In order to streamline production and operate at the highest efficiency, the company was asked to make only one type of propellers to be used on only one type of plane. The propeller chosen was a two-way controllable pitch, the plane the North American *Harvard*, now called *Texan* in this country. Back in the shipping department each day, crates of propellers designated for North American Aviation, Inc., accumulate, waiting for the next freight car to take them from Montreal, Canada, to "somewhere in the Southwest," U. S. A. Canadian Propellers are making *Texans* North American in more than one sense of the word.

Production Expanding

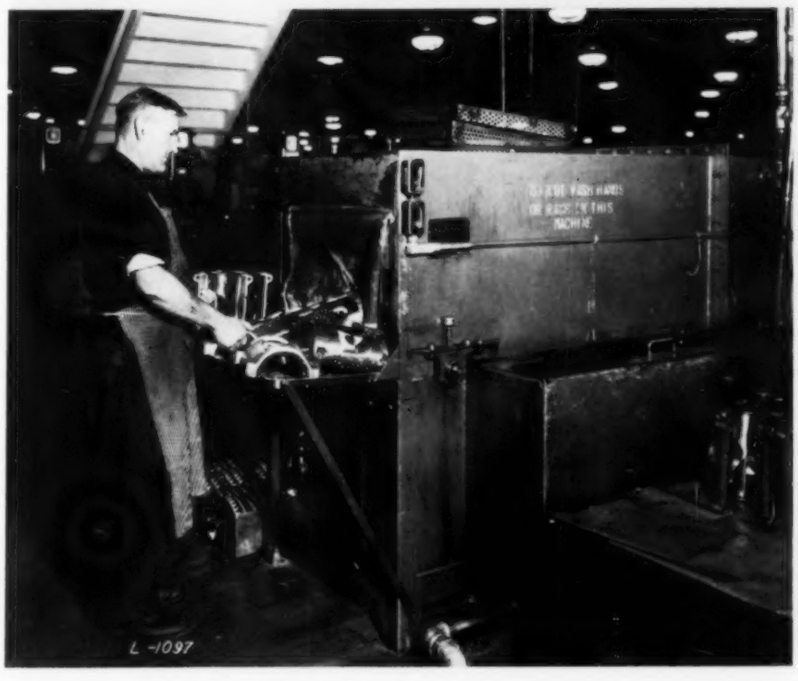
When Canadian Propellers was formed, the Canadian government set the company a goal of 200 propellers a month. Then in March, 1942, when only the first few propellers had come off the assembly lines, the American Government asked for several times the original number. In order to meet these demands, the company has constantly expanded.

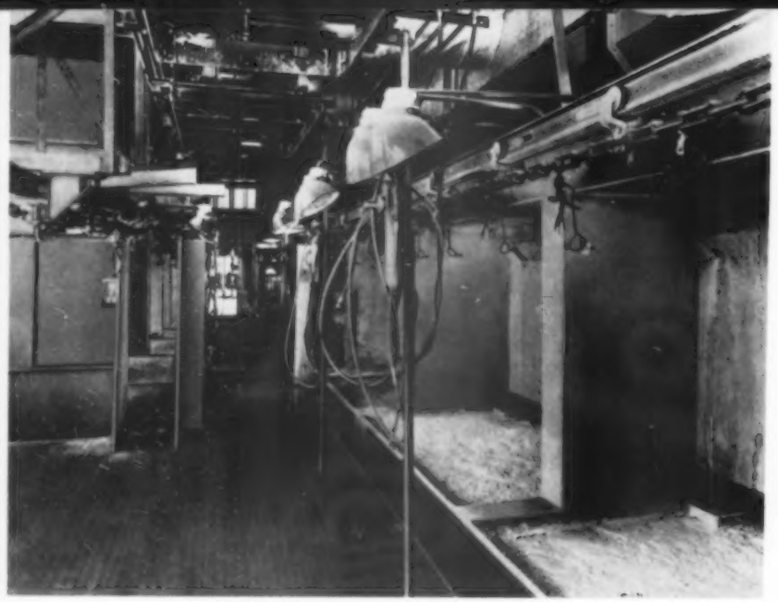
With an eye to the future, Young at the outset built a spacious plant, leaving plenty of room for new equipment. Therefore, as new machines and presses arrive today, they are moved into place without crowding anyone in the slightest. To operate them, trainees are brought in from the technical school and put to work on the job for which they have trained. Some idea of the kind of expansion Young anticipates can be gained from the fact that he had only forty employes last August, but hopes to have 1,000 eventually.

Having started with literally nothing, Canadian Propellers is now in real production and on its way to meeting the demands of the American Government. On December 5 they celebrated the completion of their thousandth propeller with a company dinner. This indicates another reason why the morale of the company is good. Present were the director-general of aircraft production, the executives and all the employes. Wherever the executives and employes of a company sit down to dinner together, there is a spirit of camaraderie which is invaluable in any work. In this case it is helping to speed Canadian propellers to the Southwest for use on vital *Texan* trainers.



PIONEERING METAL PROPELLER manufacture in Canada, these Montreal workers are assembling a two-bladed Hamilton Standard constant speed propeller of the counterweight type. Their plant is modernly equipped and includes (below) a Colt machine for washing propeller barrels and other metal parts.





A TYPICAL FINISHING CONVEYOR LINE, with spray booths arranged in staggered formation. Collected overspray may be seen floating on the surface of the water in the tank.

Effective reclamation of paint is necessary and fruitful. Here's how industry can save 50,000,000 pounds of paint ingredients during 1943.

★

By S. DONALD PERLMAN
Chief, Chemical Resources Section, Industrial Salvage Branch, War Production Board

★

Salvaging Paint Overspray

WITH the co-operation of the Chicago Section of the American Chemical Society, the Industrial Salvage Branch recently presented an exhibit at the National Chemical Exposition at Chicago, depicting recovery of paint overspray. The exhibit comprised a small water wash spray booth, a mixer of a type used by paint manufacturers in reclaiming collected overspray, and a display of samples and panels of original and reclaimed paint.

The project of recovering the critical and strategic materials from wasted paint is part of the general program aimed at getting into the production stream all salvageable chemicals vitally important to the war effort. A nation-wide survey of the paint situation, made by the Industrial Salvage Branch, has shown that approximately fifty million pounds of paint ingredients can be saved during 1943 through co-operative action by the paint manufacturing industry and its consumers. The estimated quantities of the various ingredients which can be reclaimed are as follows:

Pigments	29,573,000 lbs.
Phthalic Anhydride	3,876,000 lbs.
Glycerine	2,580,000 lbs.
Oils	5,615,000 lbs.
Zinc Yellow	2,825,000 lbs.
Glycerol Phthalate Resin	1,630,000 lbs.
Phenol Formaldehyde	840,000 lbs.
Damar Gum	245,000 lbs.
Alkyd Resins	1,330,000 lbs.
Chlorinated Rubber	238,000 lbs.
Ethyl Cellulose	238,000 lbs.
Nitrocellulose	491,000 lbs.
Plasticizers	302,000 lbs.

The supplies of these materials are limited, and their use in paints has been restricted, due either to the more urgent needs in other phases of the war effort or to the more urgent requirements of the basic raw materials used in their manufacture. The pigments, for example, contain metals such as chromium, zinc, lead, and iron, which are used in the production of alloys. Phthalic Anhydride, Glycerine, Formaldehyde, and Nitrocellulose are needed for the production of explosives. The supply of vegetable oils is insufficient to meet our needs and those of the United Nations. The natural gums are imported principally from the Orient and Africa, and the supply is, of course, uncertain.

30 Per Cent Recovery Possible

Most of the things that now come off our war industries assembly lines must be "mass-painted" by spray painting processes. This is where waste, usually called "overspray", occurs. It is known that about 30% of the paint used in these processes can be recovered by tested and effective measures. Aside from representing substantial savings of critical materials, an effective program of reclamation should mean great economy in the cost of painting our new war machines.

Satisfactory methods of reclaiming the collected overspray to yield a product equal in quality to the virgin material have been developed. In the few years since reclamation methods have been perfected, nearly three million gallons of paint have been reclaimed. It is estimated that available facilities for reclamation of wasted spray paints are sufficient to handle all of the present requirements. Approximately forty major paint and other companies have facilities available.

The reclaiming processes vary, depending upon the composition of the paint. In general, the steps comprise removal of the water, redissolving, clarifying, etc. The types of procedures used may be classified roughly into three groups—one adapted to lacquers, another to oil base and straight alkyd compositions, and a third for urea formaldehyde finishes.

Since intelligent co-operation on the part of the consumer is a prerequisite to successful reclamation, it may be well to outline the precautions which the consumer should observe in collecting the overspray preparatory to returning it to the paint manufacturer for reclamation. In addition to describing the proper method of collection, an attempt will be made to define the conditions under which reclamation is an economically feasible operation.

Probably the first thing to be done is to educate the personnel of the finishing department to regard the overspray as a valuable material. In the past, paint overspray collected in water-wash spray booths has been com-

(Continued on page 42)

2. It is requested that information relative to the availability of such films be furnished.

(Name signed)
JOHN A. SMITH,
Commanding Group No. 516.

JD/rav.

1st Ind.

Wing No. 51, Civil Air Patrol, Cols., O., April 8, 1942. To: Commander, Region No. 5, Civil Air Patrol.

1. Approved. It is understood that films mentioned in basic letter can be secured from the War Department. Advice as to proper procedure requested.

(Name signed)
JOHN DOE,
Commanding Wing No. 51.

2nd Ind.

Hq., Region No. 5, Civil Air Patrol, Chi., Ill., April 10, 1942.

To: National Commander, Civil Air Patrol.

1. Attention invited to basic letter. This Headquarters will delay any action on this matter until instructions are received from the National Commander.

(Name signed)
RICHARD R. ROE,
Commanding Region No. 5.

3d Ind.

CIVIL AIR PATROL, Off. Nat'l. Comdr., Washington, D. C., April 10, 1942.

To: Comdr. Group No. 516, Civil Air Patrol.

1. This Headquarters is now working on plans to assure from The Chief Signal Officer, training films and film strips which will be of value for use with Civil Air Patrol Training Program.

2. As arrangements have not been completed, it will be necessary to delay action pending final adjustment. However, it is believed that the following general rules will govern:

a. National Headquarters will make available selected training films and strips.

b. Each Regional Commander will arrange an itinerary within his Region and supervise the showing of films, using a projector which it is hoped to borrow from the Army Air Forces. This activity will be routed to Regional Commanders on a schedule arranged by National Headquarters.

3. A directive setting forth full details will be issued at the earliest practicable date.

By direction of National Commander JOHNSON:

(Name signed)
THOMAS BROWN,
Executive Officer.

14. Copies, number and disposition

a. Each typewritten letter will be made with at least two carbon copies, with enough extra carbon copies for offices through which the communication passes. One copy will be forwarded with the original of the communication to the office or headquarters of action, one copy will be inclosed for each intermediary office or headquarters of record through which the original communication is sent, and one copy will be retained for the records of the sending office. For example, a letter from a Squadron Commander to his Wing Commander, will be forwarded with an original and three carbon copies for distribution as follows:

(1) Original and first carbon copy—Wing Headquarters.

(2) Second carbon copy—Group Headquarters.

(3) Third carbon copy—File, Squadron Headquarters.

b. Except as otherwise prescribed and subject to the provisions of paragraph 2, above, communications, whether from a subordinate to a superior, or vice versa, will pass through intermediate commanders. This rule will not be interpreted as including matters in relation to which intermediate commanders can have no knowledge and over which they are not expected to exercise control. It is incumbent upon the writer of the basic letter to determine the number of intermediate commanders through whom the letter will pass and to furnish one copy for the headquarters of each such commander. If a letter is addressed to a higher headquarters for action but is expected to be forwarded by that headquarters for further action, additional copies will be provided.

15. Indorsements

A military letter is answered by an "indorsement" which is made part of the letter. The width of an indorsement will be the same as that of the letter. The first indorsement will begin about ½ inch below the lowest element of the next preceding matter on the same page or at the top of the succeeding page. Indorsements follow one another serially with a space of about ½ inch between them if they are on the same page. They will be single spaced, with double space between paragraphs. Midway on the page appears the serial number of the indorsement. If called for, the file number appears in the upper left corner on the same line as the serial number. A double space is left between the serial number and the indorsement heading. The indorsement heading includes the official designation of the headquarters, office or individual sending the indorsement, the name of the place, and postoffice address from which the indorsement is being sent, the date, and the word "to," followed by the official designation of the person to whom the indorsement is being sent. The body and ending of the indorsement will conform to the instructions concerning letters, with the exception that the first line of the body commences two spaces below the heading.

16. Reference forms

a. Reference to general orders, bulletins, circulars, or other similar documents ordinarily will include the following:

(1) Paragraph number, if any.

(2) Section number, if any.

(3) Title of series, e. g., "General Orders," "Training Directive," etc.

(4) Number in series.

(5) Source.

(6) Year of issue.

(7) Indication of subject matter referred to when such is not clearly indicated in context.

(8) Example: "Reference paragraph 5,
Section X, General Orders No. 1,
Civil Air Patrol, 1942."

b. Reference to letters or indorsements ordinarily will include the following:

(1) File number, if any.

(2) Office marks, if any.

(3) Source.

(4) Date.

(5) Subject.

(6) Designation or other indication of the addressee.

(7) Example: "Reference letter GM 9,
Headquarters Civil Air Patrol,
February 13, 1942,
Subject "Uniforms and Insignia for Staff Personnel," to all Wing Commanders.

c. Correspondence will always contain a specific reference by paragraph number or other designation to the regulation, order, directive, letter, or other written matter of similar character, which is applicable to the subject of the correspondence.

17. Inclosures

a. A copy of a communication which accompanies the original as required by paragraph 14 a, above, will not constitute or be noted or otherwise treated as an inclosure thereto.

b. Each inclosure will have noted thereon, ordinarily in lead pencil, but when desirable, in ink.

(1) The fact that it is an inclosure.

(2) Its number in the series.

(a) Example: Incl. 1.

c. If in duplicate, triplicate, etc., the original will be marked as in b, above, with copies marked with the number of the series at the upper right of its number as an inclosure.

(1) Example: Incl. 1^1, Incl. 1^2, etc.

d. Notations as to inclosures, if any, are made on the face of a communication, on a line with the last line of the signature, beginning at the left margin.

e. When an inclosure is first placed with a communication, notation will be made showing its number; title; if in duplicate, triplicate, etc., that fact; number of inclosures.

(1) Example: 2 Incls.—1—Pilot-Observer Report (Dup.).
2—Personnel Orders No. 14.

f. When inclosures are added or withdrawn, notation of that fact will be made.

(1) Example: 2 Incls.—1—Personnel Orders No. 10.
Added: Roster, Hq. Wing No. 31.

(2) Example: 1 Incl.—1—Form OD-9.
w/d 2 Incls.—2 & 3.

g. If inclosures are not added to or withdrawn from a communication already carrying inclosures, notation will be made showing total number of inclosures and that no change has been made.

(1) Example: 4 Incls. n/c.

18. Miscellaneous

a. The pages of the model letter, attached hereto, are arranged in the manner prescribed in paragraph 10, "How arranged and fastened;" i. e., original with pages in numerical sequence followed by original indorsements in numerical sequence, except that the last indorsement is on top. Fastening of pages should be such as to permit intentional separation without mutilation. Paper clips should be used rather than pins or staples.

b. Army regulations provide that so much of the matter specified in paragraph 11, "Heading," as is practicable, may be printed, typed or otherwise produced on the upper one-third of the page, but that names of officers or other persons, telephone numbers, etc., will not be included without specific authorization.

c. It will be noted in paragraph 6 that the size of paper used, 8x10½ inches, differs from the ordinary commercial size, 8½x11 inches.

d. Correspondence pertaining to matters of policy, matters upon which the Regional Commander may be expected to take action, or matters about which he should be informed, will pass through the headquarters of the Regional Commander. Ordinarily, correspondence pertaining to other matters will pass from Wing Commanders to the National Commander.

e. Correspondence with a headquarters will be addressed to the commanding officer thereof by official designation only and not by name, e. g., "Commander Wing No. 42, Civil Air Patrol;" National Commander, Civil Air Patrol." Correspondence with command, staff, or other officers in charge of Civil Air Patrol activities, as mentioned in paragraph 2a, above, should be addressed to the individual concerned by official designation only and not by name, e. g., "Communications Officer, Wing No. 33, Civil Air Patrol."

19. Model Letters

Group No. 516, Civil Air Patrol
Glenwood School
Glenwood and Detroit Avenues
Toledo, Ohio

April 6, 1942.

Subject: Films for Civil Air Patrol Training Program.

To: Commander, Wing No. 51, Civil Air Patrol.

1. This Headquarters wishes to secure films suitable for use with the courses of the Training Program.

40-b

OPERATIONS DIRECTIVES

NOTE: Operations Directives are released through the Operations Officer at National Headquarters by authority of the National Commander. These directives differ from training directives and general memoranda in that they set forth proper methods and procedures for all phases of Civil Air Patrol operations, provide valuable explanatory information covering CAP activities and establish official rules and regulations governing all missions, operations, activities and general practices. It is extremely important that Civil Air Patrol members familiarize themselves with all Operations Directives.

O. D. NO. 1. STANDARD NUMBERING FOR CIVIL AIR PATROL UNITS

Each Wing will be designated by a two-figure number. The first figure will be the number of the Region (Corps Area) in which the Wing is located. The second figure will be the serial number which has been assigned to the corresponding State within the Region. Thus, the Wing in the State of Maine will be Wing No. 11, while the Wing in the State of Texas will be Wing No. 81.

The Groups will be numbered serially in each Wing, beginning in each case with No. 1, and will be designated by a three or four-figure number made up of the number of the Wing followed by this serial number. Thus, the Fourth Group in the Maine State Wing will be Group No. 114, while the Tenth Group in the State of Texas will be Group No. 8110.

The Squadrons will be numbered serially in each Group, beginning in each case with No. 1, and will be designated by a number consisting of the Group number, a hyphen and the serial number. Thus, the Second Squadron of the Fourth Group in the Maine State Wing will be Squadron No. 114-2.

The Flight number will be the Squadron number followed by the letter designating the Flight. The Headquarters Flight in Squadron No. 114-2 will be Flight No. 114-2H and Flight A, in this same Squadron, will be Flight No. 114-2A.

O. D. NO. 2. DISPLAY OF CIVIL AIR PATROL INSIGNIA ON AIRCRAFT

The Civil Air Patrol insignia (blue disk with superimposed white triangle and with red three-blade propeller superimposed on triangle) shall be placed

4th Ind.

Hq. Region No. 5, Civil Air Patrol, Chi., Ill., April 14, 1942.

To: Comdr., Wing No. 51.

1. Attention invited to 3d Indorsement. No further action will be taken until directive on this subject is issued.

By order of the Regional Commander:

(Name signed)
JOHN SMITH,
Chief Clerk.

5th Ind.

Wing No. 51, Civil Air Patrol, Cols., O., April 16, 1942.

To: Comdr., Group No. 516.

1. Attention invited to 3d and 4th Indorsements.

By order of the Wing Commander:

(Name signed)
JAMES W. BLACK,
Adjutant, Wing No. 51

TRAINING DIRECTIVE NO. 30
PHYSIOLOGICAL ASPECTS OF FLYING AND MAINTENANCE OF PHYSICAL FITNESS

1. General

The purpose of this course of instruction is to familiarize all Flying Personnel of the Civil Air Patrol with the following:

a. Those physiological aspects of flying which are detrimental to the normal functioning of the human body.

b. The preventative or corrective measures to be taken to avoid or overcome these detrimental aspects.

c. The necessity for maintenance of the required high standard of physical fitness for the proper performance of flying missions.

2. Text

War Department Technical Manual (TM-1-705)—Physiological Aspects of Flying and Maintenance of Physical Fitness—will be used as the text for instruction in this subject.

3. Distribution

Copies of this Directive will be distributed on the basis of four copies per Headquarters. On account of the very limited supply available, the distribution of the Text will be limited to one copy per Headquarters.

4. Requirement

All Flying Personnel are required to take this course.

5. Instruction Procedure

It is recommended that this course be conducted by or under the supervision of the Unit Medical Officer. There will be a series of five classroom instruction periods of one hour each which will include lectures, general discussion, and questions covering this subject.

TRAINING DIRECTIVE NO. 31
FAMILIARIZATION WITH THE USE OF SMALL ARMS

1. General

Civil Air Patrol is now operating extensive Courier for the Military Services in many locations throughout the United States. Much of this Courier entails the carrying of certain equipment and documents of such a nature as to make it necessary to arm the pilots and other personnel who are carrying on this operation.

a. In view of the fact that such service is being widely expanded, and in view of the fact that many of the members of Civil Air Patrol, who may be called upon to perform such service, are unfamiliar with the use of fire arms, it is deemed advisable that suitable instruction be given so as to familiarize all members of Civil Air Patrol with the use of small arms, particularly the pistol.

b. Great care must be exercised in the carrying out of this program, as it must be borne in mind that the U. S. Government and the several States all have laws and regulations pertaining to the possession, carrying, and the use of fire arms.

c. If the second phase of this training course is to be carried out, it will be necessary for the several Unit Commanders to contact and establish satisfactory relations with the appropriate law enforcement agencies, to determine just how that part of the program can be successfully carried out without violating any laws pertaining thereto.

d. This Training Directive must not be construed as granting any authority to anyone to possess, carry, or use fire arms. It is published purely to point out the deficiency and the necessity, and to encourage familiarization with the use of small arms among all personnel of Civil Air Patrol, under the supervision of appropriate law-enforcing agencies, to the end that Civil Air Patrol may be better prepared.

2. Text

Basic Field Manual (FM 23-36) "Revolver, Colt, Caliber .45, M1917, and Revolver, Smith and Wesson, Caliber .45, M1917", published by the War Department, will be used as the text for instruction in this subject.

3. Distribution

Copies of this Directive and text will be distributed on the basis of four copies per headquarters.

4. Type of Instruction

The course will be divided into two sections. The first phase to include all instructions as relates to the use of small arms that can successfully be carried out either in class room or armory. The second phase to consist of actual range firing practice.

NOTE: (This Headquarters realizes that there may be certain Units that will not be able to carry out the second phase of this training program due to lack of suitable arms and ammunition or range facilities, but they are encouraged to proceed, at least, with the familiarization portion of the course.)

5. Requirement

All personnel of Civil Air Patrol are eligible to take this course. Instructors will certify the service record of each member who completes the course, and satisfactorily demonstrates proficiency in the use of the pistol.

6. Instruction Procedure

The services of qualified instructors should be solicited from units of the Army and Navy where available, and/or from the appropriate local law-enforcing agencies.

TRAINING DIRECTIVE NO. 32
RADIOTELEPHONIC COMMUNICATIONS PROCEDURE AND TECHNIQUE

1. General

In view of the fact that the Federal Communications Commission has now authorized certain bands of frequencies for Civil Air Patrol use, it is apparent that precautionary measures must be taken to prepare adequately all personnel who will be using this type of communication. Many of our pilots and radio men are **not** familiar with the radiotelephonic communications procedure and technique used in aviation communication from ship to ground; therefore, Communications Officers will take steps to inaugurate classes for instruction on the subject.

2. Text

U. S. Civil Aeronautics Administration's manual "Standard Airport Traffic Control Procedures", Part 1.

3. Distribution

Copies of this Directive and text will be distributed on the basis of two copies per headquarters.

4. Type of Instruction

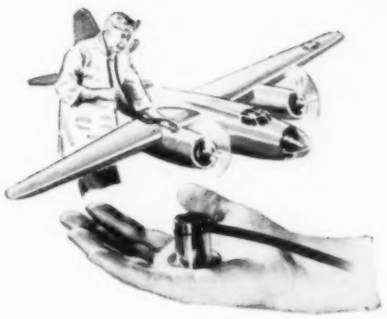
Class room instruction will consist of two instruction periods of two hours each, which will include actual operating practice through the medium of a small amplifier with two microphones, equipped in such a manner as to permit the students to take turns simulating a tower operator and a pilot operator actually conducting operations. All simulated transmissions will be in conformance with accepted radiotelephonic communication as it applies to aircraft.

5. Requirement

All Civil Air Patrol personnel are eligible to take the course. However, all personnel who are to make application for a WERS radio operator permit, must complete this course in procedures, and the Unit Communications Officer will certify on the member's application for a WERS operator permit, the fact that the applicant has satisfactorily demonstrated his proficiency in radiotelephonic communication.

IRONING OUT THE JITTER·BUGS IN BOMBERS!

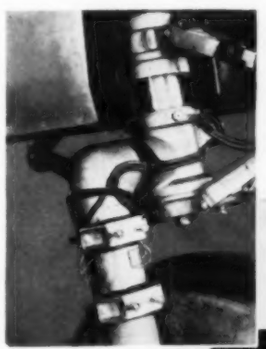
Martin Research in Vibration and "Flutter" has interesting possibilities in many industrial fields



No larger than a silver dollar, the "electric ear" that picks up vibrations.

FLUTTER, bane of aircraft builders and constant threat to test pilots, need no longer be the subject of "trial and error" research, as a result of findings recently announced by The Glenn L. Martin Company. Moreover, in seeking the origin of this deadly vibration which caused planes to shake apart in mid-air, Martin's unique Vibration Department has achieved results of unusual interest to all industry.

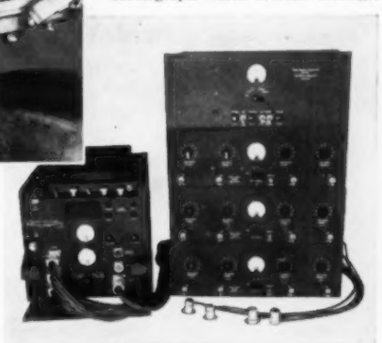
Interesting methods and weapons have been developed for this six-year war against vibration. First, was the development of an electric vibrator to set up artificial vibrations in plane parts and structures, simulating actual flying conditions. Coupled with this are the accelerometer and an oscillograph, used to detect and graphically record the vibrations under study. Both of these devices and use-techniques were products of the Martin Vibration Department. Martin research men are now able, by plotting a graph, to determine the air speed at which vibrations in various plane parts will harmonize to cause flutter and structural breakdown. If this critical speed is well above the design dive-speed of the plane, there is no danger of flutter. The same devices also provide a powerful weapon against another enemy of extreme speed in planes—compressibility. Now available to other aircraft companies, this Martin equipment along with Martin graphs and formulas, makes it possible to determine the flutter characteristics of new models during flight tests. Thus lives and costly equipment are no longer endangered by flutter, while U. S. Bombardiers are assured of steadier platforms and greater accuracy on bombing missions.



In Action on nose landing wheel, equipment records landing shocks, in much the same way that vibrations are detected and recorded.

☆

Accelerometer, below amplifies vibrations picked up by little "electric ears" (in foreground). At left is oscillograph which records findings.



New Horizons For All Industry

In addition to aiding the fight against flutter, Martin equipment is being used to determine dynamic shock and to help overcome motor vibration. This latter field holds far-reaching promise for all industry in the postwar years. Automobiles, trucks, busses, steamships, trains . . . all may be made lighter, more comfortable, smoother-riding. Buildings, housing heavy machinery, will be able to minimize rumblings, vibrations. Delicate mechanisms such as radio equipment will be better mounted for better performance.

Arch-enemy of both structural vibration and resultant human fatigue, Martin vibration research promises to play an important role in building the world of tomorrow.

If the minimizing of vibration will improve your postwar product or plant, tear out this page for your future plans file.

The Glenn L. Martin Co., Baltimore, U.S.A.

Martin
AIRCRAFT

Builders of Dependable ★ *Aircraft Since 1909*

Member: AIRCRAFT WAR PRODUCTION COUNCIL, EAST COAST, INC.

SALVAGING PAINT

(Continued from page 40)

monly referred to as "sludge", a waste product which was discarded. No particular attention has been paid to the method of collecting it or keeping it uncontaminated with other refuse. The word "sludge" has come to denote a material of no value. Paint overspray which is to be reclaimed should, however, be likened to a raw material from which paint will be made. The quality of the reclaimed paint and the cost of reclaiming will depend largely upon the care which is taken in collecting the overspray. To distinguish between the two kinds of material, we shall refer to the material which is to be reclaimed as "paint overspray".

Efficient Salvage Methods

Only one type of paint should be sprayed in a water-wash recovery unit. In some cases, the same booth may be used for two types of paint, provided there is a cut-off point and the collected overspray is removed. Do not mix two types of overspray. Where segregation is not practicable, the reclamation of a mixture of two or more colors of mutually compatible types of finishes may be worth while, provided that the reclaimed mixture, usually of neutral color, can be used to advantage as an under coat, ground coat, sealer coat, or finish for unimportant or concealed parts.

1. Contamination of paint overspray with foreign materials must be avoided. Metal objects, such as conveyor hooks, spray nozzles, bolts, and nuts, are apt to damage reclaiming machinery. Orange peels and similar refuse contaminate the paint with particles that will later disintegrate and cause film failure. Gloves and cloth wipers are apt to be ground up in the reclaiming machinery and it is sometimes almost impossible to filter out such materials. Extreme care should be taken to prevent paper or cardboard from getting into the collected overspray. Paper disintegrates and the pulp will be dispersed throughout the reclaimed paint. It is impossible to selectively filter paper pulp from the pigment.

2. Dried overspray, such as scrapings and sweepings from the dry parts of the booth, should not be added to the water-wet overspray which is to be reclaimed. In rare instances, where a relatively non-oxidizing finish is sprayed, the dried overspray may be reclaimable into usable material. Where such overspray has been found to have a salvage value, it should be scraped off as frequently as possible and immediately placed under water, as directed below.

3. Collected overspray should be kept covered with water at all times to avoid oxidation. Once the vehicle in the paint is exposed to air and oxidation occurs, the overspray is beyond recovery as a useful material. To this end overspray should be removed from the tanks regularly. This is generally done during the lunch period and at the end of each shift.

4. In the operation of a water-wash spray booth, it is generally necessary to add a chemical to the water to keep the overspray from fouling the flood sheet, nozzles, and the circulating system. There are a number of so-called spray booth compounds on the market. Although these may function efficiently in keeping the spray booth system clean, they may not yield a reclaimable material. In most cases there is a chemical reaction between the spray booth compound and the paint which is detrimental to the quality of the reclaimed product. The choice of a suitable recovery medium can be determined by trial in each individual case. The following general principles should cover the use of overspray recovery agents:

First: Use the minimum amount necessary to keep the spray booth system clean and to yield a reclaimable material.

Second: Keep a record of additions of compound and of the alkalinity of the water (determined very simply by adding two drops of Eimer & Amend B.D.H. Universal Indicator to about 20 cc. of solution or by means of a Fisher Alkacid Tester Ribbon.)

Third: This data should be tied in with the removal of the various lots of overspray. The purpose of this is to enable the reclaimer to trace the causes for improvement or impairment of the quality of the overspray from lot to lot.

5. Returns should be made in clean, open-head drums. The drum in which the original material was shipped will be satisfactory if uncontaminated with skins. Drums that have previously contained asphalt, lubricating oil, cutting oil, etc., will contaminate the material so that it cannot be successfully reclaimed. At least four inches of water should be placed on top. The purpose of this is to prevent oxidation. It is desirable to identify the contents of the return drums by indicating the type of paint overspray and location from which recovered.

6. Collected overspray should not be stored for prolonged periods in a place that is above normal temperature, and it is desirable that it be processed shortly after it is recovered. Best results are obtained by setting up a fairly prompt collection recovery reuse cycle.

AIR CARGO

(Continued from page 28)

How Speed Reduces Costs

Competitive costs of operation cannot be determined at this time, but generally speaking, most technical experts agree that the airplane is inherently the least expensive method of transportation. Only time will tell to what extent this becomes true in reality, but the speed element and flexibility of operation is not to be overlooked.

For example, the speed ratio of the pre-war airplane was an average of 160 miles per hour in contrast to the average ground transportation speed of about forty miles per hour. One airplane could make four one hundred-mile trips to one for a surface unit. This is a definite factor in reducing per mile costs. Today we are seeing this four-to-one speed ratio increased to seven-to-one with the development of faster airplanes, carrying heavier loads and flying greater non-stop distances.

Many improvements can be made in the way freight is being handled by air today. Too much time is lost in loading and unloading the airplane. Improper stowage methods necessitate longer stops at each station. These are only a few of the pitfalls that should be corrected. Another important item is quick pick-up and delivery service to and from the airport. I covered this subject earlier in this article and definitely believe it is the difference between success and failure of efficient air freight service.

Loading is Problem

New loading devices are being designed to simplify the stevedores' work. One in particular is an hydraulic lift that lifts the freight to a rail which extends outside of the cargo door of the airplane. This rail is built into the top of the cabin and extends the length of the freight compartment. This method seems to be the best discovered so far, as it enables the cargo handlers to place the freight in the proper place with the greatest of ease. It speeds up loading, unloading and proper stowage within the airplane.

If you can look forward a few years, it is not hard to see regular air freight schedules all over the world. In fact, the airlines are educating their fliers on these routes today.

Overnight delivery from Moscow to the West Coast will be common. England and other European countries will be just an overnight flight. It is here today in terms of the airplanes of war. It only awaits the cessation of hostilities for its peace-time unfolding.

GREATER NAVY STRIKING POWER
FOR THE SEVEN SEAS FLEET
Increased range and fire power was the logical result when the U. S. Navy pioneered development of dive bombers which now pace our winning fight on the seven seas.
Through the power of Brewster Blasters and other Navy dive bombers the Axis will learn the bitter folly of attempting unwarranted aggression against strong nations united by a determination to remain forever free.
BREWSTER Blasters
BUCCANEER AND BERMUDA DIVE BOMBERS

THE *Sky's the Limit*

BY BILL GREEN

Interpreting the Freezing Order . . . If it helps win the war we're for it . . . How the appraising and purchasing system works . . . Private flying is all over . . . But the CAP still flies.

Curtailment of Civil Flying

Private flying, as we have known it, received another set-back the other day, when the WPB freeze order hit. Under that order, no single-engined airplane of 500 horsepower or less, now in private hands, may be sold, rented, transferred, nor delivered to any other party, except by special permission of the WPB.

Essentially, this means that there can be no charter or student work, unless the flying is done in the war effort. The order especially points out that it is for the purpose of reducing to a minimum all the private flying not directly related to the war effort. It means that no more flying clubs may be organized. The order states that no member of an existing club may sell or transfer his or her interest in or to any plane owned by the club.

Apparently the order was for two purposes: (1) To conserve parts, gasoline and oil, and the airplanes, themselves, and (2) to remove competition in the purchase of equipment so that it might be picked up by the CAA, at reasonable prices, for use in the CAA War Training Service. Both purposes are reasonable and logical, although it is a serious blow to private flying, as we have known it, and it will, in fact, probably kill it completely. Temporarily, there seems to be no alternative.

Our first job is to win this war. Then we can resume our normal peacetime pursuits. In the meantime there are practically no spare airplane parts for private types of airplanes or engines, as our manufacturers were almost 100 per cent caught with their window shades up — or however you want to say it. Anyway, they didn't have any parts when the war started —and now we haven't much except the airplanes themselves, and such salvage as results from other airplanes which may be de-commissioned. Since most of the aircraft plants which formerly produced our type equipment are at present doing other, more important, war work, the very existence of the whole CAA War Pilot Training Program was threatened. This program has literally turned tens of thousands of selected and partially trained students into the later stage schools. Unquestionably the program must continue. Anyway, now it's too late to do much more than gripe about how it will affect you.

One thing to consider is that if you have a single-engined airplane, in the class of 500 horsepower or less, and were using it in private, non-war work, the chances are that you will be permitted to fly it until it requires essential parts — which you will not be able to obtain. Then you are shut down — perhaps for the duration.

The CAA has already sent out its proposed method of appraising and buying such airplanes as it may desire. Briefly, the appraisal will be made by the Aircraft Procurement Supervisor of your CAA regional headquarters office. Do not call Washington. The price will be based on the last published manufacturer's list price of the equipment and the airplanes will be depreciated evenly over a ten-year period down to a residual price of 20 per cent. We presume this means a depreciation of 8 per cent per year. Instruments and other equipment which may have been installed since the airplane was put in use will be depreciated at the same rate, from their new price, and from the date the airplane was re-certificated following such installation. So far we don't know what will happen if you decide you don't want to sell at the appraised figure. Undoubtedly, the new appraisals will not be as high as some airplanes have been sold for, in the recent past. Perhaps it will be nowhere near as high as the propositions you may have had in the last few months. However, some of the trades that have been made recently were fantastic — pure gyps, in fact. While we have been having price controls on other things the prices on aircraft have gone sky high — even in some cases it is reported that the government has paid more than new price for some second-hand jaloppies with beaucoup hours. Sometimes one wonders how some people get by without being incarcerated. Anyway, that business is, we hope, now over.

Civil Air Patrol Affected

For the time being, we understand, Civil Air Patrol may continue to operate on its training and other war missions, and will be able to rent, operate, and obtain parts and repairs for its airplanes. Probably it will be able to enroll more equipment under this new arrangement, since it has constantly expanded the scope of its duties and operations for the Army and Navy.

Thus, it may be that within a short time there will be practically no flying of civil nature in the country except by the CAP and the CAA War Pilot Training Programs and such few other persons as may own airplanes and utilize them in connection with their efforts in national defense. This may result in the abandonment of a few airports around the country — a lamentable possibility, in view of the long time, hard cash, and prodigious amount of effort put into getting them going. However, if the local boys really want to keep them going they may always get some bona fide CAP programs going—and there is plenty of opportunity along that line, for anyone who really wants to work. The time to work on this is *now*. Get in touch with the local CAP headquarters —or call up your Wing Commander. Someone will know who he is. If you can't find out any other way, write us —we will be glad to give you his name and address. The whole point is that we should make every effort to hold all the ground we have won for these many years. An airport and flying facilities are a definite asset to any community. When you lose your airport you have slipped back a few notches.

Fighting Power for 2000 horses

HUMBLE-ESSO AVIATION GASOLINE

Many of the 2,000-horsepower engines that power America's newest fighting planes thunder into battle on Humble-Esso Aviation gasoline. Millions of gallons of this high-octane aviation fuel come from our refineries, one of which has produced more aviation gasoline than any other plant in the world.

Humble products and Humble people are in the fight. More than 2,000 Humble employees are serving with the armed forces, and backing them up are 13,000 civilian soldiers whose entire efforts are devoted to the production of petroleum war products.

In addition to Humble-Esso Aviation Products, we are furnishing special stratosphere greases and instrument oils, tremendous quantities of Toluene (basic ingredient of TNT), asphalt, rust preventives for aircraft engines and many other special products for the air forces.

HUMBLE

HUMBLE OIL & REFINING COMPANY

Today Humble-Esso Aviation Products serve the vital demands of war; tomorrow they will serve equally well the needs of peace.

NAA's 10,000th Trainer Leaves Dallas Factory

J. H. Kindelberger, president, revealed in February that North American Aviation, Inc., had delivered its 10,000th trainer from the Dallas factory "some time ago—so long ago, in fact, that it is no longer confidential." North American builds AT-6 single-engined combat trainers, P-51 Mustang fighters and bombers which have not yet been officially identified by the company at its Texas plant.

Five Billion Dollars' Worth of Planes, Engines, Propellers Produced in 1942; Industry will Boost Deliveries in 1943 to Twelve Billion Mark

The aviation industry during 1942 produced $5,000,000,000 worth of airplanes, engines and propellers, as compared with only $1,750,000,000 for 1941 and $544,000,000 for 1940.

During 1943 the industry's output in dollar value will soar to the $12,000,000,000 mark, which will make aviation the nation's No. 1 manufacturing enterprise.

These figures were announced during February by the Aeronautical Chamber of Commerce of America, which reported the aviation industry was faced with a $22,000,000,000 backlog of unfilled orders.

Indicative of the unprecedented expansion which the aircraft industry has undergone since 1939, the Chamber revealed that:

1. More than 630,000 productive employees are now on the payrolls of the aircraft manufacturing firms, a figure which will be swelled to almost 1,000,000 when peak expansion is attained.

2. About 175,000 women are now employed in the airframe, engine and propeller plants; approximately 35 per cent of all new persons hired during 1943 will be women.

3. The industry is presently utilizing 73,000,000 square feet of productive manufacturing space—this figure to be eventually increased to more than 100,000,000 square feet.

4. In terms of pounds of airframes, the 1943 production probably will be triple that of 1942.

5. The present year will see larger bombing planes carrying huge bomb loads faster than the speed of most of the current fighter models, and warplanes having speeds in excess of 450 miles an hour will be announced.

FOUR HUNDRED BOYS, sixteen and seventeen years of age, went to work February 1 on the assembly lines of Lockheed and Vega Aircraft Corporations in Burbank, under a plan with the Burbank and Pasadena schools to alternate four weeks of attending school with four weeks of building airplanes, thus filling 200 assembly jobs and relieving the manpower shortage. The boys must have parental consent, meet scholastic requirements, and be finally approved by Lockheed and Vega. They earn regular wages while completing their high school education.

West Coast Aircraft Deliveries Show Increase of 240 Per Cent by Weight

Citing greatly increased production on the West Coast, the Aircraft War Production Council says its eight member companies are now delivering more than $5,500,000 worth of airplanes daily, with deliveries during the first thirteen months of war increasing 240 per cent by weight and 147 per cent by dollar value. Manhours have increased only 99 per cent, indicating the sharp increase in efficiency necessary to reach the high output.

"Those weight increases, which are the most realistic index to production accomplishments, tell the story of emphasis on heavy bombers and greater armament," Robert E. Gross, Council president and head of Lockheed, said. "Deliveries by weight increased 8.4 per cent in the single month from November to December, 1942." It was pointed out that the pounds of airplanes produced for every manhour worked have been increased 86 per cent, effecting savings of hundreds of thousands of manhours.

The Council reported 1734 normally confidential technical engineering reports, each improving design and construction, have been interchanged among the member companies. Over 16,000 emergency exchanges of production items have averted bottlenecks due to shortages in materials, and in more than two score cases of machinery breakdown at some plant another has taken on actual production work during the repair period.

Member companies are Consolidated, Douglas, Lockheed, North American, Northrop, Ryan, Vega and Vultee.

Boeing Boosts B-17 Output Four Times Since Pearl Harbor

Receiving a white star for its Army-Navy "E" award, the Boeing Aircraft Company has revealed it is producing four-engined B-17 bombers "four times as rapidly as during Pearl Harbor." On August 10, 1942, Boeing became the first aircraft manufacturer to win the "E", and was then turning out B-17's at a rate "two or three times that at the time of Pearl Harbor."

Production has been accelerated without unusual enlargement of facilities—a feat attributed in part to the "multiline production" system the company has developed. Instead of a single, elongated assembly line, carrying the entire airplane, Boeing uses several production lines, each of which builds and completes a portion of the Flying Fortress. This enables Boeing to concentrate on more production within their plant than would be possible were they to use a single assembly line. Final assembly of the Flying Fortress has been reduced to merely a joining of these pre-completed portions.

SIXTY PER CENT of the work of building Army P-39 Airacobra wings, performed on these constant-motion lines at Bell Aircraft Corporation, is now done by women workers. It is believed this is the first time that combat aircraft wings have been built in a single holding fixture, rolling down a conveyorized line.

Glenn L. Martin Heads East Coast Council; Engineer "Swap" Told

At a meeting at Buffalo, N. Y., the Aircraft War Production Council, East Coast, Inc., elected Glenn L. Martin, president of the company bearing his name, to succeed G. W. Vaughan, head of Curtiss-Wright Corporation, as president of the Council, and J. Carlton Ward, Jr. president of the Fairchild Engine and Airplane Corporation, as vice president.

Vaughan, a leader in the formation of the Council, said one of the organization's outstanding accomplishment had been an arrangement for the exchange of service engineers, who have been made available by member companies to serve each other wherever they may be needed in this country or on the war fronts.

Martin praised the Council's various committees for their work in enabling the industry to improve production. The committees, composed of leading technical men of the East Coast, develop theories from actual observation at the front.

Member companies are the Aviation Corporation, Bell Aircraft, Brewster Aeronautical, Curtiss-Wright, Eastern Aircraft Division of General Motors, Fairchild, Martin and Republic Aviation.

HOLD OUT! WE'RE ON THE WAY!

DELIVERY PROMISE was made last month for Henry J. Kaiser by this cartoon and caption in the Hughes Aircraft Company's Hughesnews

SAE Materials, Processes Units Meet in Dallas; Specifications in Demand

Important revisions in aircraft materials and processes standards were studied during February when three specifications committees of the Society of Automotive Engineers conducted conferences in Dallas.

In charge of the meetings, which lasted one week, was J. B. Johnson of the AAF materiel center at Wright Field, chairman of the SAE Aircraft Materials and Processes Co-ordinating Subdivision. The subdivision's three subdivisions conducted the meetings. Their chairmen are L. D. Bonham (Lockheed), airframes; B. Clements (Wright), engines, and N. E. Woldman (Bendix-Eclipse), accessories.

The SAE's aeronautics division, of which Arthur Nutt of the Wright Aeronautical Corp., is chairman, has announced distribution of the 1,500,000th copy of the SAE Aeronautical Materials Specifications, which standardize requirements for raw materials. Distribution of the specifications, supplied to over 3,000 purchasers at a cost of less than 3 cents each, was begun in May, 1940, and reached a peak of 60,000 copies in one week in January, 1943. Total January, 1943, distribution was 254,235 copies, as compared with full-year totals of 223,448 for 1940, of 246,168 for 1941, and of 814,921 for 1942.

So far 283 specifications have been completed. Nearly 150 have been revised at least once, and ninety specifications are now undergoing preparation or revision.

A HIGH-SPEED air-driven router speeds Lockheed production. It trims off and trues the skinned edges of the P-38 nose wheel well, in the bottom of the fuselage. Formerly, every door was a hand-fitted job. This router, operating on tracks built into an insertion jig, now makes this opening uniform in every plane, and eliminates hand fitting of the doors, which required many man-hours of work.

Jouett Says Higgins' New Orleans Factory Will Be Completed in 3 Months

Erection of Higgins Aircraft, Inc., facilities at New Orleans is progressing rapidly and will be completed by June, and the first of 1,200 plywood twin-engined Curtiss Caravan transports to be built there will be delivered 180 days after the factory is finished. This announcement was made by Col. John H. Jouett, executive vice president of Higgins Aircraft, in an address which featured the February meeting of the Texas Section of the Society of Aeronautical Engineers.

Col. Jouett, whose appearance was the first at a gathering since he left the Aeronautical Chamber of Commerce last fall, said Andrew J. Higgins, the New Orleans shipbuilder, is a graduate engineer who "knows his plywoods and phenolics about as well as anyone in the United States." He will make his own plywood at New Orleans.

Allen Guiberson, vice president of the Guiberson Diesel Engine Company and chairman of the Texas Section, who presided, was complimented by Col. Jouett, who said air-cooled Diesel engines, developed in America by Guiberson, will be an important factor in developing air commerce after the war. Col. Jouett was introduced by Captain George E. Haddaway, editor of SOUTHERN FLIGHT, who is on leave of absence as a Civil Air Patrol base commander. Three hundred Texas aircraft engineers attended.

Guiberson Expands Diesel Development for Aircraft

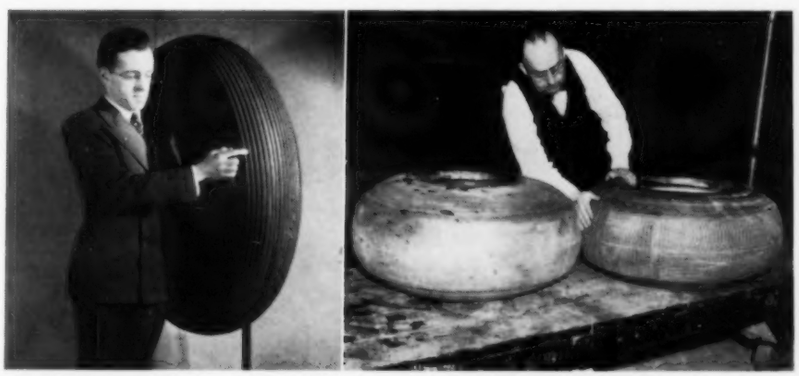
John W. Horner, experimental research engineer, has joined the development staff of the Guiberson Diesel Engine Company, it was announced by W. E. Lind, director of research for the company, which is expanding its development of radial, air-cooled Diesel engines for aircraft and other uses.

Horner, who is engaged in stroboscopic studies of valve gear, combustion phenomena and other phases of activity in the Guiberson single-cylinder laboratory, was formerly with the Lawrence Engineering and Research Corporation, of Linden, N. J., where he had been engaged in research, and the Chrysler Corp.

CESSNA TRAINERS, such as this U. S. Army "Bobcat" (AT-17), are daily flying the equivalent of more than forty times around the earth at its equator. These trainers are used for bomber-pilot training and provide an intermediate step in the student's progress from single-engine craft to multi-engine combat bombers.

Bendix Gets Huge Loan From 60-Bank Syndicate

To finance its growing development and production of aircraft instruments and controls, and devices for other uses, the Bendix Aviation Corporation has completed arrangement for a $150,000,000 "V" loan, or revolving war credit. Sixty banks made the credit available for Bendix, said E. R. Breech, president. Amounts borrowed from the credit will bear 2¼ per cent interest, and ¼ per cent interest will be paid on the unused part of the credit, which will run for three years.



NEW METAL-TREAD non-skid airplane tires made their appearance last month. A B. F. Goodrich technician (left) points to steel coils "laced" into the rubber tread. Goodyear's expert (right) shows how metal springs are imbedded in the carcass before the mold is applied, after which the familiar diamond design is also imparted to the tread.

Carl Friedlander on Aero Chamber Board

Light plane manufacturers are represented on the board of the reorganized Aeronautical Chamber of Commerce by Carl I. Friedlander, president of Aeronca Aircraft Corporation.

Full details of the election of officers by the Aero Chamber will be found on page 50.

Kartveli Given Degree by Temple University

Alexander Kartveli, vice president and chief engineer of Republic Aviation Corporation, has been honored for designing the Republic P-47 Thunderbolt, the Army Air Forces high altitude fighter airplane. He received the honorary degree of Doctor of Science from Temple University in Philadelphia.

Spartan Aircraft Adds More Space at Tulsa

The second major addition to the Spartan Aircraft Company's plant at Tulsa, Okla., was to be finished in February. Glass enclosed, the new addition almost doubles the floor space used for production purposes. It will be used principally for final assembly lines, although some fabrication work will be done there. Among the features of the new unit are modern heating and air-conditioning systems. Lighting in the final assembly department will be provided by incandescent hollophane units.

Expansion of the plant space will help to speed up production and will relieve crowded conditions. Also, reserve space will be available for future developments.

3rd Annual SAWE Meet at Texas A. & M. May 3-5

The Society of Aeronautical Weight Engineers will meet May 3, 4 and 5 at College Station, Texas, for its third annual conference, Howard W. Barlow, national chairman for 1943, announced. Barlow stated that the conference will be concerned with government revisions, adopting weight and balance control standards and developing handbooks for aircraft and airline executives.

Aircraft Leaders Exchange Ideas at Sessions of Eastern Council's Technical Committees

Teamwork was practiced in earnest recently when technical committees of the Aircraft War Production Council, East Coast, Inc., met in Buffalo at the Airplane Division of Curtiss-Wright. Production ideas for speeding deliveries, increasing efficiency and promoting improvements in aircraft were exchanged in accordance with the Council's policies developed since it was organized last October. Five important committees were photographed at the sessions and are introduced in the following group pictures.

SERVICE COMMITTEE, Seated, left to right: F. C. Fagley (Brewster), N. L. Kearney (Curtiss-Wright), L. H. Clark (Curtiss-Wright, Col. W. V. Andrews, chairman, (Curtiss-Wright); Miss D. Carr, secretary; and F. Kent Bradford (Fairchild). Standing, left to right: R. Pattinson (Curtiss-Wright), H. A. Hamilton (Curtiss-Wright), Miss J. Reipe, secretary; A. E. Green (Curtis-Wright), E. C. Rust, Jr. (Bell), J. T. Ogle (Martin), Art Gratop (Aviation Corp.), W. F. Miller (Curtiss-Wright), W. H. Hughes (Curtiss-Wright), Allen Wescott (Eastern), Don Tasker (Republic), Don Parker (Republic), A. Wille (Curtiss-Wright).

MATERIAL COMMITTEE: Left to right: Frank Maley (Curtiss-Wright), D. B. Cole, (Curtiss-Wright), A. K. Peck (Republic), J. H. Prodoehl (Bell), H. V. Zimmer (Aviation), Norman T. Shaw (Bell), S. W. Lauer (Martin), O. C. Mueller (Eastern), H. E. Harmon (Eastern), J. D. Hewitt (Fairchild) and V. N. Thacker (Brewster).

Alcoa Price Cut Announced

A new and lower schedule of prices for semi-fabricated and fabricated aluminum became effective March 1, 1943, Roy A. Hunt, president of the Aluminum Company of America, announced. He said the cut resulted from a renegotiation agreement entered into with the government by Alcoa.

STEEL RULE Dies SINCE 1900

SPEED AND ECONOMY

We Are Making Dies for Many of the Leading Airplane Plants.

For Cutting Everything — Even Wood

J. A. Richards Co. Kalamazoo, Michigan

PROPELLERS OF SUPERIOR PERFORMANCE

- 15 Years of Propeller Production
- Calibrated and Designed for Maximum Efficiency
- Constructed for Lasting Service

FAHLIN MFG. CO. COLUMBIA MO.

REPAIR SERVICE

- For All Types and Makes of Propellers
- 2-7 Days at the Factory
- CAA Authorized Station

FAHLIN MANUFACTURING COMPANY

INDUSTRIAL RELATIONS: Seated is C. S. Matoon (Curtiss-Wright), chairman. Left to right: Paul Frizzell (Fairchild), Vaughn Bell (Bell), R. E. Waldo (Eastern), A. L. Kress (Republic), Earl E. Neubig (Fairchild), M. C. Monroe (Republic), C. W. Bishop (Aircraft Corp.), R. H. Puffer (Curtiss-Wright) and E. J. Walsh (Eastern).

SUBCONTRACTING COMMITTEE: Left to right, A. T. Foley (Brewster), I. J. Snader (Aviation Corp.), G. A. Schwobel (Brewster), John J. Lee (Curtiss-Wright), Alfred Marcne (Republic), J. P. Bauer (Bell), Phil Harr (Fairchild), George W. Lohr (Curtiss-Wright), Lester Benson (Bell), C. S. Swayze (Eastern), E. J. Hanson (Eastern), W. A. Bates (Brewster) and T. B. Soden (Martin).

Potassium Cyanide Speeds Silver-plating of Bearings

The rate of silver-plating bearings for aircraft engines has been more than trebled by the use of potassium cyanide, formerly imported from Europe but now recovered by recrystallization from California salt deposits and manufactured by a plant of the E. I. du Pont de Nemours & Company.

The project has made possible heavier plating, for coatings of silver deposited on the bearings range from three to five one-hundredths of an inch in thickness, whereas silver electrodeposits usually are measured in thousandths.

Literally tons of silver are used weekly in the fabrication of aircraft bearings.

C & S Adds Little Rock

Daily passenger, mail and express service was inaugurated March 1 to Little Rock, Ark., on the Chicago & Southern Airlines route connecting Houston and Shreveport with Memphis.

B-H

MANUFACTURERS of SHEET METAL and TUBULAR ACCESSORIES

ENGINE MOUNTS

CONTRACTORS TO ALL LEADING ENGINE and PROPELLER MANUFACTURERS

B-H AIRCRAFT CO.

LONG ISLAND CITY NEW YORK

ENGINEERING RESEARCH COMMITTEE: Seated, left to right: E. L. Zivi (Martin), H. E. McDonald (Curtiss-Wright) and R. W. Miller (Republic). Standing, left to right: G. W. Lescher (Fairchild), R. D. MacCart (Brewster), R. W. Gibson (Bell) and W. F. Burke (Eastern). S. K. Hoffman of The Aviation Corporation was not present when this photo was taken.

NO TIME ON OUR HANDS

Lost Manpower means Defeat. Our hours are **ALL** *hours . . . total time for Victory*

THE AIRCRAFT STEEL & SUPPLY COMPANY

378 INDUSTRIAL BLVD Dallas, Texas — WICHITA, KANSAS — FAIRFAX AIRPORT Kansas City, Kan.

St. Louis, Mo. Oklahoma City, Okla. Tulsa, Okla.

EVAN E. YOUNG, vice president of Pan American Airways System, received two Inter-American Safety Council awards from R. Hummel, president of the Council. These awards were given to the Eastern and Western Divisions for a perfect safety record during 1942. The award was made at a luncheon at the Bankers Club on February 15, 1943, given by the Pan American Society, of which Frederick E. Hasler (center) is president.

Georgia Air Service and Southern Airways Merged for Expanded Operations

Merging of the combined interests of Georgia Air Service, Inc., with Southern Airways, Inc., and its affiliated companies, has been announced.

Southern Airways, Inc., of Georgia, as the new company will be known, will operate four "power" schools, training hundreds of Army Air Forces combat pilots; one school for glider pilots; and several schools under the CAA War Training Service program providing instruction for members of the Army and Navy enlisted reserve.

Operating activities of the new company will include thirteen strategically located air fields in Georgia, Alabama, South Carolina and Tennessee, making this company one of the largest fixed-base operators in the country, with unequalled possibilities for postwar expansion into airline operations, aircraft sales, service and maintenance, and all important phases of aviation.

Representing an aggregate flying experience of over five hundred thousand hours, the consolidation brings together one of the largest groups of experienced flying instructor and maintenance personnel in the entire country, with more than five hundred experienced pilots and as many more trained mechanics and other aircraft specialists. Altogether the combined companies have approximately fifteen hundred employes throughout the Southeast.

Officers of the new company will be: Frank W. Hulse of Decatur, Ala., president; Cody Laird of Atlanta, Ike F. Jones of Camden, S. C., and W. F. Underwood of Atlanta, vice presidents; Ben T. Smith of Jackson, Tenn., secretary and treasurer. Directors of the company, in addition to the officers, are: H. T. Dobbs of Atlanta, chairman of the board; James V. Carmichael of Marietta, Georgia; and T. A. Mott of Camden, S. C.

Southwestern Volume Up on American Airlines

The Dallas-Los Angeles route of American Airlines is one of the heaviest on the system in air express, according to figures received by Jack A. Tompkins, Southern regional traffic manager, from M. D. Miller, manager of air mail, air express and freight for the airline.

The greatest increase in air express on a percentage basis in January, 1943, was between Chicago and Fort Worth where the increase was 299.71 per cent with the poundage going from 18,982 to 75,874. This increase is largely due to the stepped-up air express traffic with Mexico and Canada, the Canadian express having increased 145.22 per cent over January last year, according to Tompkins.

Air mail figures for January this year show a 77 per cent increase over the same month last year when 945,526 pounds were flown as contrasted with 1,678,198 pounds in January, 1943. The increase in air express, computed on the same basis is 80.39 per cent, 678,643 pounds in January, 1942, and 1,224,196 pounds in January, 1943. The pound miles of express flown were 626,229,905 as against 338,659,279, which is an increase of 84.91 per cent.

Army Operates Elaborate Repair-Overhaul Service for Engine Maintenance

American production line efficiency has its counterpart in the Army's huge aircraft motor overhaul depots located strategically about the country.

Plane motors have been taken out, flown to an overhaul depot, completely rebuilt, tested, and flown back for installation in forty-eight hours.

The importance of aircraft engines gives them preferential treatment in this war. That's why the vastly-efficient repair depots operate their pick-up and delivery service by air.

The dirty, dusty engine coming in for refitting first gets a bath, with cleaning compound. Then it is torn down completely. Specialists work over each part, which is inspected at least three times by three different men. Any worn part is replaced.

The engine begins to take form again on the reassembly line. Specialists man each station. When an engine is complete, it can be better than new. During its service various improvements of design and service and material have been made in factories, and the latest overhaul has advantage of them. Thus there is constant rejuvenation of motors.

Put together again, the rebuilt engine is "run in" in test cells for hours. Instruments carefully check all operations. Unless these are satisfactory, the engine is taken apart again for inspection. When it gets the O.K. tag, it is flown back to its waiting plane.

Wenigmann at Vultee's Nashville Division

Ernest Wenigmann, works manager at the Vultee Louisville Modification Center since its inception early last year, has assumed his new duties as works manager of the Nashville Division of Vultee Aircraft. Wenigmann started with Glenn L. Martin in 1924 as a mechanic, sheet metal and assembly worker.

New Officers Elected By Aero Chamber to Complete Reorganization

Election of new officers and an executive committee has completed the reorganization of the Aeronautical Chamber of Commerce of America, Inc., national trade association of the aircraft manufacturing industry.

James P. Murray, vice president of the Boeing Aircraft Co., Seattle, Wash., was elected president of the Chamber and I. H. Taylor of Washington, D. C., was made general manager. Three vice presidents were elected, including J. Carlton Ward, Jr., president of Fairchild Engine & Airplane Corp., New York; C. S. (Casey) Jones, Newark, N. J., president of Casey Jones School of Aeronautics, and J. Story Smith, vice president of Jacobs Aircraft Engine Co., Pottstown, Pa. Frank N. Fleming, assistant secretary, and Washington representative of the Douglas Aircraft Co., was elected secretary, and John E. P. Morgan, Washington representative of a group of light plane companies, was elected treasurer.

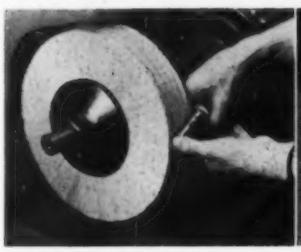
The executive committee includes J. A. B. Smith, vice president of Curtiss-Wright Corp., chairman; Frederick R. Neely, Bell Aircraft Corp.; John Montgomery, Consolidated Aircraft Corp.; Carl Friedlander, president of Aeronca; Joseph T. Hartson, executive vice president of The Glenn L. Martin Co.; L. T. Cohu of Northrop Aircraft Corp., and Charles Marcus, vice president of Bendix Aviation Corp.

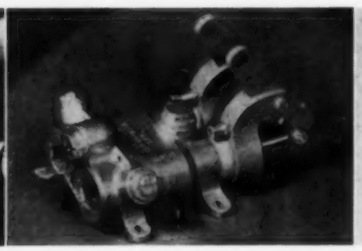
The board of governors is composed of Carl Friedlander, Aeronca Aircraft Corp.; Rudolph Deetjen, the Aviation Corporation, Lycoming Division; Fred R. Neely, Bell Aircraft Corp.; Charles Marcus, Bendix Aviation Corp.; James P. Murray, Boeing Aircraft Co.; John K. Montgomery, Consolidated Aircraft Co.; J. A. B. Smith, Curtiss-Wright Corp.; Frank N. Fleming, Douglas Aircraft Co., Inc.; J. Carlton Ward, Jr., Fairchild Engine and Airplane Corp.; C. S. Jones, Casey Jones School of Aeronautics; J. T. Hartson, the Glenn L. Martin Co.; C. S. Jones, Casey Jones American Aviation, Inc.; H. W. Cohu, Northrop Aircraft, Inc.; Thomas A. Morgan, Sperry Gyroscope Co., Inc., and Raycroft Walsh, United Aircraft Corp.

The Chamber's new president is dean of the aircraft industry representatives in Washington where he has represented Boeing since 1928. Prior to that time he had over 5,000 hours as a pilot, beginning with the RCAF in Canada in 1917, then piloting transcontinental air mail from 1920 to 1928.

MORE SPEED, RANGE AND STRIKING POWER than possessed by any dive bomber in action is claimed for this Curtiss A-25, now in mass production in the Missouri Plant of the Airplane Division, Curtiss-Wright Corporation. The A-25 is the Army's version of the Navy's famed Curtiss SB2C-1 Helldiver. The A-25 is a two-place, mid-wing monoplane with retractable landing gear, a Wright engine and Curtiss electric propeller.

NEW PRODUCTS





Brushing Wheels Have Many Uses

The Osborn Manufacturing Co., of Cleveland, Ohio, has developed new brushing wheels and new techniques for their many uses in aircraft industry. Shown above is a treated Tampico wheel used to remove burrs, sharp edges and tool marks and to blend surfaces to minimize the danger of fractures from stress concentration points. An Osborn development keeps the surface accuracy of polished push rod ball ends within four millionths of an inch. A brushing formula reduced from hours to a few seconds the time required to true two tiny intersecting slots of the ends of bronze camshaft bearings, formerly hand-scraped.

Simplified Brake Valve Developed

Replacing the one previously manufactured by the company, Aircraft Accessories Corporation has developed a greatly simplified brake valve designed for foot-pedal operation of brakes where power is supplied direct to the brakes from the main hydraulic system through a hydraulic accumulator. It has only two moving parts in addition to the lever, and working units are contained in a replaceable cartridge. It weighs only 3.25 pounds for a double unit. Sensitive pressure control is provided and the valve will operate all types of brakes now in use without additional pressure reducing unit or other equipment. The valve is normally used in planes with gross weight in excess of 12,000 pounds.

Reflected Light Works Signal

Littelfuse Inc., Chicago, Ill., and El Monte, Calif., announces its No. 1534 Signalette, a new indicator for aircraft use which is operated entirely by reflected light and radio activity, operating by fluorescence under "black light" from the usual sources within aircraft. A radium-active fluorescent paint used shows signals in total darkness. A savings in current is effected, as it uses only 1.5 watts as against the approximate four and one-half watts used by ordinary lamps. Not being bothered by glare, the pilot does not have to dim his Signalette, and there are no burnouts. Test samples are available to government agencies and to companies which outline their application so that engineering test data can be secured.

Felt Replaces Rubber Covers

Western Felt Works, Chicago, has developed a felt treated and molded "overcoat" for vital aircraft instruments. Extremely close limits of treating, molding and cutting are effected. The firm's chemists have produced many applications of felt to replace rubber, synthetic rubber, copper and other critical materials.

Wire Stitching for Aircraft Parts

A new-type wire stitching process that makes several hundred stitches per minute, and binds rubber, fibre board, plastics and laminated wood to stainless steel or aluminum has recently been developed by the American Steel and Wire Co. of Cleveland, subsidiary of United States Steel Corp.

Dependable HELP!

FOR MEN CONCENTRATED ON AN OBJECTIVE

Mechanically de-polarized FUSE ELEMENT Twisted at 90° against vibration. Littelfuse "Gooseneck" spring-forming takes up contraction and expansion. Littelfuse Locked Cap Assembly prevents caps from ever loosening.

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LITTELFUSES

Millions of Littelfuses are in all branches of the Services—meeting *today's* unprecedented demands with NEW design and construction. Terrific vibration and shock, sudden temperature changes from 60 below zero to 120 above, are withstood by exclusive Littelfuse factors.

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Second Annual Aviation Conference to Be Conducted May 6-8

The Second Annual Texas Aviation Conference will be held at College Station, Texas, May 6-8, with a full program devoted chiefly to serving the aircraft industry but also including activities for the Civil Air Patrol, Texas Private Fliers Association and aviation in general. Howard Barlow, head of the Aeronautical Engineering Department of A. & M. College of Texas, and George E. Haddaway, editor of SOUTHERN FLIGHT, are co-chairmen of a general committee of twenty planning the Conference. Over 400 leaders of the industry attended the Conference in 1942 at College Station.

Texas' Legislators Ignore Strong Protests

Although hundreds of aviation operators and enthusiasts, represented by a large delegation, vigorously protested a proposed Texas senate bill to regulate aviation under the state's railroad commission, a committee reported favorably on a substitute bill. The substitute has now been strongly attacked by the Texas Private Fliers Association and others and a showdown is expected soon. Proponents seek to "declare the state's sovereignty over the air space" and otherwise impose state regulation of aviation.

STREAMLINED CONTROL CARS for U. S. Navy blimps are flowing in daily increasing numbers down a long production line in one of the Goodyear Aircraft Corporation plants in Akron—the only production line of its kind in the world. Construction starts with the cars in an inverted position. Halfway through, the cars are turned up in their flying positions, as here, for attaching the motors to the outriggers and for other final touches.

Unorthodox Tooling, Other Factors, Delayed Willow Run Production

Attempting to explain the long delay in production at Willow Run, the Office of War Information has cited four main contributing factors, three of which are more or less common throughout the aviation industry. The fourth factor concerned Ford's tooling, with the OWI stating: "There is no question that production could have been started at Willow Run many months sooner had more conventional methods of tooling been followed."

Committee Studies Post-War Aviation Policies

Secretary of State Cordell Hull has appointed an interdepartmental committee to establish policies for developing post-war aviation. Members are Assistant Secretary of State A. A. Berle, Jr., chairman; Robert Lovett, assistant secretary of war; Wayne Taylor, under secretary of commerce, and CAA Chairman L. Welch Pogue.

Model Helicopter Demonstrated

Richard Quermann, seventeen, of Clarksburg, W. Va., demonstrated his micro-film and balsa wood helicopter model in flight for 3 minutes and 2.1 seconds in the rotunda of the United States Museum of Natural History in Washington recently.

New Heavily-Armed Nazi Strafers Make Appearance

A new twin-engine, low-wing Messerschmitt, heavily armed, and carrying 2,200 pounds of bombs is being used in daylight raids over Great Britain.

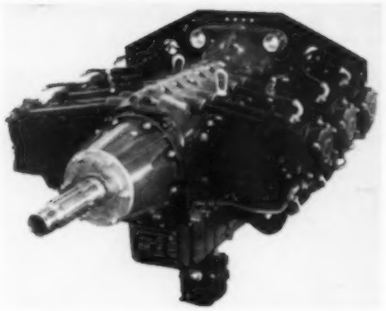
With an estimated top speed of 370 to 380 miles per hour at 18,000 feet, it could be used as a long-range fighter, dive-bomber or ground-strafer. The fighter-bombers, several of which have been shot down, have a two-man crew, are armed with two fixed 7.9 mm machine guns, two fixed Mauser cannons in the nose and two 18 mm. guns, and are protected by 900 pounds of armor plate.

Gen. Andrews Honored by Panama for Service

Lt. General Frank M. Andrews, USA, now in charge of U. S. Army operations in the European theater of war, was recently awarded the Order of Vasco Nunez de Balboa by the Panamanian Government. General Andrews formerly commanded the U. S. forces in the Caribbean area. His daughter, Jean, received the award in his absence.

Dr. Lewis Named Collier Trophy Chairman

Dr. George W. Lewis, for many years director of Aeronautical Research of the National Advisory Committee for Aeronautics, has been elected new chairman of the Collier Trophy Award Committee. This announcement was made by Gill Robb Wilson, president of the National Aeronautics Association. Dr. Lewis' appointment comes in recognition of his long experience in new developments in the field of aeronautics.



A NEW LYCOMING flat, geared engine identified as the GO-435 has been announced. It is a six-cylinder, horizontally opposed engine of 210 horsepower with propeller reduction gearing. It uses 73-octane fuel and incorporates a planetary type reduction gearing. The GO-435 engine gear ration of 77:120 provides a propeller speed of 1,925 r.p.m. at the rated crankshaft speed of 3,000 r.p.m. The gear unit is self-contained and assembles on the forward face of the crankcase. The propeller thrust is taken on a ball bearing on the propeller shaft. Complete detailed description and specifications can be obtained by writing directly to the Lycoming Division, The Aviation Corporation, Williamsport, Pa.

High Altitude Combat

Flying at 40,000 and 50,000 feet, with the cockpit temperature at 67° below zero and the instruments covered with ice, "Spitfires" recently shot down three high-flying Ju 86P Diesel reconnaissance aircraft in the Middle East, according to a British announcement.

Russian Output Up 75 Per Cent

Producing sixteen squadrons of airplanes in excess of their 1942 goal, the Soviet aircraft industry exceeded their 1941 output by 75 per cent, and at the same time improved the quality and fire-power of their aircraft.

MAJ. GEN. JAMES H. DOOLITTLE has been presented the National Aviation Training Association's annual aviation achievement award, an exact replica of the North American B-25 Mitchell bomber which he flew in the famous Tokyo air raid. On the base is a plate with these words: "Aviation Achievement Award, 1942, Presented by National Aviation Training Association to Maj. Gen. James H. Doolittle — William A. Ong, President, N. A. T. A."

Austin, Texas

Aviation Regulation Bill Gets Top Interest

On Tour with Tony—Via one good Aeronca from Hampton, Phene Williams (TPFA) and Tony flew down to Waco where the wind pushed us back almost as fast as we were flying . . . So along with Cliff Howard, Bill Hammond, from Waco, Lee Davis and Orville Brokaw from Big D, we took off in a Buick to Austin. Seems like the boys and gals were havin' a gathering over this bill No. 51.

We arrived to find the place buzzing with private pilots from all over the state. Mac Davis, Howard Smith, Bill McDonald, Clint Shirley, Roy Taylor, Les Bowman, Lou Foote, Ed Ritchey, Buck Rowe, W. U. Paul, Capt. Geo. Haddaway, Capt. James Camp, Major H. D. Byrd (ain't the CAP uniforms double dillies?), E. B. Germany, Wilson Germany and wife, Charles Beard, some folks out in West Texas whom we didn't get to pass the time a day with, plus scads of others . . .

We all went over to the Capitol and listened to a great deal of conversation about Senate Bill No. 51, which has to do with state regulations of aviation . . . Seems like not many were for it; in fact, there was a howl agin it. The Texas Private Fliers Association didn't get to speak their piece . . . ran outta time. They are writing their Senators and telling 'em the way they think . . .

The hanger talk that night was mostly about the bill, and everybody chose sides and gave the subject fits . . . never have seen so much agitation, or so many pilots feudin' together afore . . . .

Next day, we hit another head wind, and bucked our way home in Bob LeSage's Beechcraft . . . Never felt so much like a cork in our lives . . . "It warn't light plane flying" . . . and that's for sure . . . but they have just started to have a good fight . . . that bill's gonna be talked about plenty more . . . 'bye now.

TONY HAGMANN

Enlist in your CIVIL AIR PATROL

Dallas, Texas

Harry Spencer Rescued from Iceflow

On tour with Tony—Bob Millsap of *Hampton Airport* called the clan to a meetin' and stirred up a first-class hornets' nest with the news that a bill was a fixin' to be passed which would tax private aviation, among other things. Well, the clan was against it, of course, and flew down to Austin to get a "say so" in the right quarter . . . they howled loud enough . . . betcha!

More Hampton news is that Jack Booth and H. C. Browning (Hudsonites) landed, paid their nickel and said if we knew anybody who wanted a clean Luscombe to look 'em up . . . (Ad). And J. C. Adams who owns the pretty low-wing also has a purty wife.

Curry Field—Ole Schell joined the howl agin' the bill—and meant it plenty, too . . . Bill Campbell, who owns Campbell Duplicator Co., 'lows that he always sees SOUTHERN FLIGHT in every office waiting room . . . after handling so many air mail letters a local letter man (U. S. Post Office) decided to learn an easier way to deliver the mail . . . so Bill Carver is taking lessons . . . Joe Leak tole us so!

Lou Foote's Airport—Lou Foote flies a mean Stinson in the wind . . . 'cause we went up when it was more than a little bit of a blow. Lou's another one against that dadgummed bill . . .

The first class of marines have finished their primary and are scheduled for secondary here, too. The next batch has arrived.

White Rock Airport—"Hink" Hinckley, McWhirter and the assistant pastor of the First M. E., who wants to be a flyin' parson, were watching a white horse and a set of tractors give the runways a going over when a Navy SNJ came over to show us how it's done . . . When he came in for the coke, Ensign H. P. McGinnis, USNR, said: "If I'd known you all were watching, I'd have done a better job." . . . A better job couldn't have been done. Turns, Immelmans, snap rolls, slow rolls and the works. J. H. Lindsey, USNR, was with him, and said: "Boy, what a ride!" He loved it . . . who *wouldn't?*

Hudson Airport—Mac Davis and Howard Smith, who have worked double hard to kill S. B. 51 (That *bill*) flew to Austin and gave out with plenty of ammunition . . . George Culler and R. P. Dabney also flew down to Austin to help.

This airdrome had the most pilots at Uncle Bob's Meetin' . . . L. L. Dickeson, a Luscombe fan from Mineral Wells, flew over to Big D and saw ole Bill Campbell.

Mustang Airport—Harry Spencer was rescued from an iceflow in Greenland. Harry had been flying a hazardous course, and they found him forced down and floating away . . . in fact, they figgered he was a gone gosling till spring . . . but the lucky lad is on his way home for a leave.

It is reported that L. D. Moot (HP) has a very bad case of "Inspectoritus" . . . he's after his commercial. Seems he's pretty good and plenty nervous . . . why? ¿Quien sabe? . . . Saw Joe Alcorn, Cross Country I. G. Showers, Herbert Nash, Instructor Miss Brooks and little Miss Pat Crowell at the hot grocery counter . . . "Jiggs" Murray, former Houston boy, is hittin' the air out here now.

Love Field—Gene Tiger, the flying wildcat, hit the deck with Sterling Boller, a former "B" Liner pilot with a million milespin . . . and they are a two-man fire department. Their "soup cards" (instrument ratings) are old enough to vote. In a Lockheed Biggie, one was checking the other out . . . forget which one was doing the job . . . but when the count was finished, there was Jack Huff, another Lockheed man; Lt. Willy Lake from Long Beach Ferrying Command; Frank Say, back from Ireland; and Lorraine Sanders, Gene and Sterling "remembering when" . . .

'Bye now . . .

TONY HAGMANN

Enlist in your CIVIL AIR PATROL

Kansas City, Mo.

Girls Selected for Aviation Engineering Training

Not Amusin'—Something new in the way of uniforms has been added to confuse the civilians and enlisted men. That is the uniform of civilian airline flyers who are flying air cargo routes of the transport command of the Army Air Forces.

Maj. David Kratz of St. Louis, new wing commander of the CAP, conferred with Capt. Frank Tracy, commander of the Municipal Terminal CAP Squadron, and other officers. The CAP continues to do a vital part in the war effort of this city.

Famous Visitors—The first day of February found Charles A. Lindbergh making a brief tour of inspection of our airport—and two weeks later Mrs. Franklin D. Roosevelt landed and took off from our Municipal Airport. In the one and one-half hour interim she inspected two WAAC hotels and the WAAC radio school!

Veteran—One of our veteran flyers, and a figure on our Municipal Airport, has transferred his allegiance to the Fairfax Field, where he is thrilling to something new in the flying game—being a test pilot. Tex LaGrone has been kidded about being "mugged" by so many cameras lately, but his infectious grin meets all comers.

Women in Aviation—On February 15th three young women became aviation engineering "Cadettes." The girls were selected to take this training of ten months at the University of Kansas City.

Mr. George W. Krebs, recently returned to Kansas City from flying the Pan American-African route, was guest speaker at the February dinner of the Kansas City Unit, Women's National Aeronautical Association. His nine months of flying experience in Africa were highlighted for an assembly of members and guests in the Pioneer Room at the Hotel Phillips. Another guest was the newly appointed Aviation Commissioner for the Chamber of Commerce, Richard C. Murray. Mr. Murray was formerly manager of the civic department of the Tulsa Chamber of Commerce. He succeeds Russell Cantwell, who resigned from the Kansas City Chamber of Commerce in December, 1942.

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Transfer of CAP to Army Rumored Again

Rumors of Army absorption of the CAP have not abated, although National Headquarters has issued nothing to indicate such a move was anticipated. The latest was published in the magazine *Newsweek*, which said "a complete overhaul of CAP control was already in the making." The plan, said the magazine, would take the CAP "out of OCD hands and turn it over to the Army in toto." Thus, said *Newsweek*, "CAP members will get Army pay and privileges, plus military priority on equipment and repair needs. The job of shifting the OCD's functions to the Army was being worked out by the Budget Bureau."

FDR Awards Air Medal To Two CAP Members For Heroic Sea Rescue

For bravery in rescuing a comrade afloat in the Atlantic, two CAP officers received the first awards for civilian service when they were presented the Air Medal by President Roosevelt in a White House ceremony recently.

Major Hugh R. Sharp, Jr., of Wilmington, Del., and Ensign Edmond I. Edwards, Newark, Del., now in the Navy, were honored for their rescue of Lt. Henry T. Cross, Columbus, Ohio, Pilot of a CAP plane that crashed about twenty miles off shore last July. Lt. Edgar Shelfus, also of Columbus, the observer, was lost. Cross, though injured and burned, inflated his life belt, and was seen and reported by radio from a sister ship.

Realizing that Cross would be drowned in the rough sea before Coast Guard boats reached him, Sharp, who was Base Commander, and Edwards, then a lieutenant, took off in a Sikorsky amphibian, though landing on the stormy waves was considered practically suicidal.

Sharp expertly brought the ship down near Cross, and Edwards threw a rope, but Cross, paralyzed, was unable to grasp it. Sharp then maneuvered the ship close enough to pull him aboard. In the turbulent waves, the left wing float was damaged, and in order to keep the plane upright Edwards crawled out on the right wing, and clung there for nearly eleven hours while the plane was brought ashore.

Major Gen. George E. Stratemeyer, Chief of the Air Staff, praised the two CAP officers for their spirit, and General Orders No. 1 of the War Department described their mission as one requiring "outstanding initiative, resourcefulness and a high degree of courage."

How Freeze Order Affects CAP Missions

The recent War Production Board order freezing all aircraft of 500 h.p. or less in the hands of their owners has affected Civil Air Patrol operations in several ways. Active duty missions, authorized by National Headquarters, are proceeding as usual, but Washington now considers all planes placed in coastal patrol, Army and industrial courier service and other emergency missions to be in such missions "for the duration."

Temporary permission has been granted CAP members to rent CAP planes for bona fide student instruction until April 1. Application blanks have been sent by National Headquarters to all Wings to tag all aircraft available to CAP. Owners with good ships can figure, says Headquarters, that if not rented by CAP, their aircraft may be requisitioned and bought by other agencies. Members wanting to register their planes as being available for CAP missions should see their Wing Commanders immediately.

Cleveland Courier Station Serves 150 Vital War Industries

Cleveland's Civil Air Patrol Courier Service, first large-city station to be established, is piling up impressive records by flying war industry personnel and vital materials when other means of transportation are unavailable. Over 150 firms are on its roster, and within a 300-mile radius of Cleveland are such important war production centers as Chicago, Indianapolis, Cincinnati, Dayton, Louisville, Pittsburgh and Buffalo.

The service is financed by underwriting, each industry by subscribing to its facilities posting $150. Each time an underwriter uses the service he is charged an hourly rate based on the horsepower of the plane he chooses to use, with the rates starting at $5.92 per hour for a 75-h.p. plane and ranging as high as $23.97 an hour for a 345-h.p. craft. Added to this charge is 12½ cents per flight-hour for insurance. These costs, based on the actual cost of operation, figure unusually low when the flexibility of the service is considered. It remains the same whether one or several persons travel together, and whether the cargo is ten pounds or 500 pounds. The underwriter is privileged to have the plane wait for him while he continues his business at various stops, in which case he pays a stand-by charge of $1 per hour after the first hour but no more than $10 in any twenty-four-hour period. If a customer flew from Cleveland to Wright Field in a 75-h.p. plane and had it wait for him at Dayton for six hours, the round trip would figure only $36. Two men on the same basis would pay the same, or $18 each.

The Cleveland Courier Service is operated under the managership of Lt. Dean H. Robinson, and its pilots, who include Arlene Davis, women's Bendix trophy winner, and aircraft meet strict requirements. To fly passengers in contact weather, pilots must hold an effective CAA certificate of the grade of private pilot or better and must have officially logged a minimum of 200 hours, including not less than fifty hours of cross-country. To fly express cargo, a pilot must hold a private license or better and have a minimum of fifty hours, of which a large portion must be cross-country.

All monies remaining in the account of the service at the end of the war will be returned to the underwriter on a pro rata basis.

Attention!

CAP MEMBERS

SOUTHERN FLIGHT's CAP Directives, formerly inserted in ALL copies of the magazine, are now included ONLY in the CIVIL AIR PATROL EDITION going to subscribers who are in the CAP.

It is possible that a number of SOUTHERN FLIGHT subscribers have not advised this office of their CAP membership. As a result they may receive the regular edition instead of the Civil Air Patrol edition. If this happens to YOU — and you want the CAP Directives — please notify us promptly and we will change your mailing accordingly.

PLEASE NOTE—The CAP edition differs from the regular magazine only in the insertion in it of the CAP Directives. All of the regular features appear in both editions.

SOUTHERN FLIGHT
Circulation Department
P. O. Box 750 Dallas, Texas

David Kratz, 29, of Missouri, Is Youngest CAP Wing Commander

MAJ. DAVID KRATZ

The Public Relations Office of the Missouri Wing of the Civil Air Patrol at Lambert Field announces the appointment of Major David W. Kratz, new Missouri Wing Commander, to succeed Major William B. Robertson.

The youngest wing commander of the Civil Air Patrol, 29-year-old Major Kratz has had twelve years background in the aviation school, airline, and service business in St. Louis. He has flown over 3,500 hours in all types of aircraft. Graduating from McCaullis Military Academy, he learned to fly at Bowman Field, Kentucky. For the past several years Major Kratz has served as a pilot, being commissioned in the U. S. Army Air Corps Reserve.

He is president of the St. Louis School of Aeronautics, which is turning out hundreds of Army pilots and mechanics.

IMPORTANT INFORMATION FOR CAP MEMBERS

Training Directives 28 through 32, included in the March Civil Air Patrol Edition of SOUTHERN FLIGHT, contain material scheduled to appear between Training Directive No. 27 and Operations Directive No. 1. Civil Air Patrol members who have been following and saving these directives published in SOUTHERN FLIGHT will please note that this material goes between pages 62 and 63, published in the December, 1942, issue, and the pages have been numbered 62-a, 62-b, etc., accordingly.

CARRY ON, CAP . . .

SILENT PARTNERS TO CAP, Air Associates will continue to supply the parts and accessories necessary to help "Keep 'em Flying".

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Nine-Year-Old Wants To Join Air Patrol; Has Eight Hours Dual

A letter received by the editor of SOUTHERN FLIGHT should interest every member of the Civil Air Patrol. Neatly written in pencil, it expressed the kind of interest in the CAP which is making the organization one of the greatest services ever performed by civilian aviation. Here's the letter:

"Dear Sir:

"My Dad is an old-timer. He has flown since 1912 and now he is a pilot in CAP Squadron 213-1.

"Is there any junior CAP?

"I am only nine years old, but I've been flying since I was six years old, and have about eight hours dual.

"Yours truly,

"George Yanchenko,
"2002 Janes Street,
"Syracuse, N. Y."

SOUTHERN FLIGHT hopes George Yanchenko will join the CAP Cadets and that the Syracuse unit and the New York Wing will lose no time in seeing that his participation in their activities, as a mascot or better, is arranged. The editor has forwarded his unusual letter to National Headquarters for Major Earle L. Johnson's personal attention, and, to keep alive the youngster's interest in the CAP, we have sent George a gift of SOUTHERN FLIGHT'S Civil Air Patrol Handbook and a complimentary subscription to the magazine.

FOR SALE: TIRES WHOLESALE

New factory stocks. Our Specials: 6.00x6 non-skid 7.00x4. 8.00x4 smooth 2-ply $8.75. 4-ply $10.75. Tubes $3.25. Large stock 6.50x10, 7.50x10, 8.50x10, Culver 5.00x4, new production 4-6 ply, 8"-10" and all sizes tail wheel tires. New Goodrich 6x2 solids $1.45. Big stock Tires, Propellers, Spark Plugs, and Batteries. Rush delivery in any size, supplying many of the largest operators at lowest prices. Shipment C. O. D. Inspection allowed, guaranteed merchandise.

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CAA CLASSIFIES PARACHUTE RIGGERS AS TECHNICIANS

As of January 21, 1943, all Parachute Riggers will be inspected for reclassification and graded into three divisions. All parachute lofts must now be certified.

The three grades of parachute riggers will be: Parachute Rigger, beginners; Senior Parachute Rigger, for experienced riggers; and Master Parachute Mechanic. The Master Parachute Mechanic certificate will be issued to those with more than five years' experience in all phases of parachute work.

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Boots all-metal nuts are not only lighter, but literally "outlast the plane."

Specially developed for motor application, the new Boots "Rol-Top" Self-Locking Nut is winning a wide acceptance among engine manufacturers.

Saver of Precious Metal

Because Boots Self-Locking Nuts are lighter, they save millions of pounds of strategic metal. The Anchor Nut (shown in cross-section above) is the type of Boots Nut most commonly used on military planes. It operates on the familiar Boots self-locking principle. The threads of the top, locking section are slightly out of phase with those of the lower, load-carrying section. When the bolt engages the locking section, a constant pressure is established which prevents any loosening due to vibration.

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